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1.0 PROJECT OBJECTIVES

The project objective is to design and construct facilities for the military that are consistent with the design and construction practices used for civilian sector projects that perform similar functions to the military projects. For example, a Company Operations Facility has the similar function as an office/warehouse in the civilian sector; therefore the design and construction practices for a company operations facility should be consistent with the design and construction of an office/warehouse building.

Comparison of Military Facilities to Civilian Facilities

Military Facility	Civilian Facility
Combined SFAC & WTUAS	Office Building and Community Center

It is the Army's objective that these buildings will have a 25-year useful design life before a possible re-use/re-purpose or renovation requirement, to include normal sustainment, restoration, modernization activities and a 50-year building replacement life. Therefore, the design and construction should provide an appropriate level of quality to ensure the continued use of the facility over that time period with the application of reasonable preventive maintenance and repairs that would be industry-acceptable to a major civilian sector project OWNER. The site infrastructure will have at least a 50-year life expectancy with industry-accepted maintenance and repair cycles.

The project site should be developed for efficiency and to convey a sense of unity or connectivity with the adjacent buildings and with the Installation as a whole.

Requirements stated in this contract are minimums. Innovative, creative, and life cycle cost effective solutions, which meet or exceed these requirements are encouraged. Further, the OFFEROR is encouraged to seek solutions that will expedite construction (panelization, pre-engineered, etc.) and shorten the schedule. The intent of the Government is to emphasize the placement of funds into functional/operational requirements. Materials and methods should reflect this by choosing the lowest Type of Construction allowed by code for this occupancy/project allowing the funding to be reflected in the quality of interior/exterior finishes and systems selected.

1.1. SECTION ORGANIZATION

This Section is organized under 6 major "paragraphs".

- (1) Paragraph 1 is intended to define the project objectives and to provide a comparison between the military facility(ies) and comparable "civilian" type buildings.
- (2) Paragraph 2 describes the scope of the project.
- (3) Paragraph 3 provides the functional, operational and facility specific design criteria for the specific facility type(s) included in this contract or task order.
- (4) Paragraph 4 lists applicable industry and government design criteria, generally applicable to all facility types, unless otherwise indicated in the Section. It is not intended to be all-inclusive. Other industry and government standards may also be used, where necessary to produce professional designs, unless they conflict with those listed.
- (5) Paragraph 5 contains Army Standard Design Criteria, generally applicable to all facility types, unless otherwise indicated in the Section.
- (6) Paragraph 6 contains installation and project specific criteria supplementing the other 5 paragraphs.

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2.1. WARRIORS IN TRANSITION (WT) COMPLEX

This project shall consist of constructing a standard design for a combined WT Administrative Services Facilities (WTUAS) and site as outlined in the Statement of Work. WTUAS are comprised of administration, command operations, special functions, storage and other support areas. The SFAC is intended to be similar both functionally and technically to a community center in the private sector. The facilities shall include, but is not limited to: offices, reception areas, corridors, restrooms, computer room, child activity room, conference room, mechanical rooms, electrical rooms, storage areas. Additional facility and functional support amenities shall be provided as outlined in the Statement of Work. The varying components for this facility will be: building occupancy requirements, regional soils and climatic conditions, facility structural considerations, HVAC systems, and the exterior architectural features. Therefore, the overall building design and configurations will vary as required to meet project specific requirements.

The facility floor plans for the Warriors in Transition (WT) facilities are provided in Appendix J. These drawings indicate functional and operational arrangements that meet the user's requirements. The Design/Build (D/B) contractor is required to follow these mandatory designs.

Minor plan alterations, not more than eight (8) inches, are permitted only when necessary to accommodate building system requirements. However, the Minimum Area Requirements identified in Chapter 3 shall not be reduced in order to accommodate building system requirements. Office locations shown on the facility floor plans included in this RFP shall not be altered or relocated as they meet the mandatory adjacency requirements.

2.1.1. Not Used

2.1.2. SFAC and WTUAS

The SFAC facility type is to provide various services to soldiers and their family while the soldier is undergoing medical treatment. The facility will also serve as a social gathering place for scheduled activities.

Provide a 67,100 gross square feet combined 3 – Story SFAC and WTUAS consisting of:

Four 53 PN Large Company Headquarters (CoHQ) at 11,000 gross square feet each, a 24 PN Battalion Headquarters (BnHQ) at 8,100 gross square feet, and a 28 PN Large Soldier and Family Assistance Center (SFAC) at 15,000 gross square feet.

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2.2. SITE:

Provide all site improvements necessary to support the new building facilities. Refer to Paragraph 6.

Approximate area available 2.00 acres

2.3. GOVERNMENT-FURNISHED GOVERNMENT-INSTALLED EQUIPMENT (GFGI)

Coordinate with Government on GFGI item requirements and provide suitable structural support, brackets for projectors/VCRs/TVs, all utility connections and space with required clearances for all GFGI items. Fire extinguishers are GF/GI personal property, while fire extinguisher brackets and cabinets are Contractor furnished and installed CF/CI. All Computers and related hardware, copiers, faxes, printers, video projectors, VCRs and TVs are GFGI.

The following are also GFGI items: Refrigerators, Microwave Ovens, Combination Oven/Range with hooded exhaust, vending machines

2.4. FURNITURE REQUIREMENTS

Provide furniture design for all spaces listed in Chapter 3 and including any existing furniture and equipment to be re-used. Coordinate with the user to define requirements for furniture systems, movable furniture, storage systems, equipment, any existing items to be reused, etc. Early coordination of furniture design is required for a complete and usable facility.

The procurement and installation of furniture is NOT included in this contract. Furniture will be provided and installed under a separate furniture vendor/installer contract. The general contractor shall accommodate that effort with allowance for entry of the furniture vendor/installer onto this project site at the appropriate time to permit completion of the furniture installation for a complete and usable facility to coincide with the Beneficial Occupancy Date (BOD) of this project. The furniture vendor/installer contract will include all electrical pre-wiring and the whips for final connection to the building electrical systems however; the general contractor shall make the final connections to the building electrical systems under this contract. Furthermore, the general contractor shall provide all Information/Technology (IT) wiring (i.e. LAN, phone, etc.) up to and including the face plate of all freestanding and/or systems furniture desk tops as applicable, the services to install the cable and face plates in the furniture, the coordination with the furniture vendor/installer to accomplish the installation at the appropriate time, and all the final IT connections to the building systems under this contract.

The Government reserves the right to change the method for procurement of and installation of furniture to Contractor Furnished/Contractor Installed (CF/CI). CF/CI furniture will require competitive open market procurement by the Contractor using the Furniture, Fixtures and Equipment (FF&E) package.

2.5. NOT USED

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3.0 WARRIORS IN TRANSITION COMPLEX (WT)

3.1. General

WT Complexes are required by the Army to encompass living, training, social interaction and administrative/command operations. A WT Complex consists of WT Barracks, WTUAS, and SFAC. In addition, a Central Plant (CP) and Dining Facility (DFAC) may be part of the complex. These facilities (with outdoor areas) and any additional support structures and amenities; shall be arranged on the site as a unit to allow injured or temporarily disabled soldiers to live, eat, train, and work together. This project consists of the following facilities described below.

SFAC is a community building for social interaction and special assistance to the soldiers and their families.

WTUAS are comprised of administration, command operations, special functions, storage and other support areas.

3.2. FUNCTIONAL AND AREA REQUIREMENTS

Gross building area shall be calculated in accordance with Appendix Q. Net area is measured to the inside face of the room or space walls. Minimum dimension where stated shall be measured to the inside face of the defining enclosure. Net area requirements for programmed spaces are included in this paragraph. If net area requirements are not specified, the space shall be sized to accommodate the required function and to comply with code requirements, overall gross area limitations, and any other requirement of this RFP. Area requirements for corridors, stairs, electrical rooms, and mechanical rooms will typically be left to the discretion of the offeror but shall be counted in the general authorized gross square footage for each facility. Coordinate column spacing and layout with the building's floor plan so that columns occur within or in alignment with walls where they may be concealed as much as possible. Hold columns occurring within spaces to a minimum and limit them to larger public spaces. Plan column placement such that they do not interfere with the functionality of the space.

3.2.1. ACCESSIBILITY REQUIREMENTS

<u>General Requirements</u>: All buildings in the WT Complex shall be accessible and shall comply with the Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities as currently amended.

Elevators: The Army Standard for WT Complexes requires that an elevator be provided for any building which exceeds one-story (1-Story). The elevator system shall fully comply with ASME A17.1 and ASME A17.2.1 in their entirety, as well as any additional requirements specified herein. Primary elevators shall be centrally located within the facility and shall have a minimum rated load capacity of 3,500 lb (1588 kg), Amend 1 interior dimensions sized to accommodate a fully extended Emergency Medical Services (EMS) gurney, approximately 24 inches wide by 77 inches long, and four average sized adults. An additional elevator, meeting all specifications outlined above, shall be provided. Amend 1 for every additional one-hundred (100) persons, or fraction thereof over the first one-hundred (100) persons the building is designed to accommodate, unless determined otherwise by a foot-traffic analysis. Such foot-traffic analysis shall be included in the general facility Design Analysis. Amend 1 All elevator interior walls, doors, and fixtures shall have a Satin No. 4 Stainless Steel Finish. All elevators shall be furnished with removable hanging protective pads and fixed hooks to facilitate conversion to use for moving freight.

<u>Elevator Machinery Spaces</u>: Elevator pits, penthouses, and other such elevator equipment spaces are exempt from accessibility requirements in accordance with ABA Section F203.6.

<u>Certified Elevator Inspector</u>: The Elevator Inspector shall be certified in accordance with the requirements of ASME A17.1 and ASME QEI-1 and licensed as a Certified Elevator Inspector by the State where the project is constructed. The Certified Elevator Inspector shall inspect the installation of the elevator(s) to assure that the installation conforms to all contract requirements. The Certified Elevator Inspector shall be directly employed by the Prime Contractor and shall be independent of the Elevator System Manufacturer and the Elevator System Installer.

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3.2.2. Not Used

3.2.3. CoHQ (Note: Not all offices are included on every building size. See 3.2.3.2 Space Allocation Table).

3.2.3.1. Functional Space Requirements

- (a) Commander: Provide a private administrative office.
- (b) Executive Officer: Provide a private administrative office.
- (c) Supervisory Case Manager: Provide a private administrative office.
- (d) Nurse Case Manager: Provide a private administrative office.
- (e) Case Manager: Provide a private administrative office.
- (f) First Sergeant: Provide a private administrative office.
- (g) Platoon Sergeant: Provide a private administrative office.
- (h) Squad Leader: Provide a private administrative office.
- (i) Social Worker: Provide a private administrative office.
- (j) Extra Office: Provide a private administrative office.
- (k) Conference Room: Self Explanatory.
- (I) Supply Room: Provide room for miscellaneous administrative supplies.
- (m) Records Room: Provide room for administrative records storage.
- (n) Reception/Waiting Room: Provide a vestibule between the exterior and the reception/waiting room. Provide a minimum of 7 feet clearance between doors. Provide a means for the doors to open automatically via a sensor or push button. Provide a reception station consisting of a built-in reception counter for each company (shall be combined in a multi-company setting). Reception counter shall be capable of serving both able and disabled personnel.
- (o) Distribution Center: Provide room for administration personnel to provide support service for the distribution of materials.
- (p) Copier and Fax Room: Self explanatory.
- (q) Interior Corridors: Provide 6 feet minimum wide corridors.
- (r) Men's Restrooms: Provide toilet facilities and one shower stall to serve the public and administrative personnel assigned to the building. Provide a dressing area with a built-in 18 in. bench adjacent to the shower stall. Showers will only be provided in staff restrooms in those buildings where public and staff restrooms are separated.
- (s) Women's Restrooms: Provide toilet facilities and one shower stall to serve the public and administrative personnel assigned to the building. Provide a dressing area with a built-in 18 in. bench adjacent to the shower stall. Showers will only be provided in staff restrooms in those buildings where public and staff restrooms are separated.
- (t) Janitor Closet: Provide with a 10 in. deep floor mounted stainless steel mop sink with hot and cold service faucet, a four holder mop rack, and two 18 in. deep by 48 in. long heavy duty stainless steel shelves for storage of cleaning supplies. Provide space for storage of buckets and a vacuum.
- (u) Open Office Space: Provide space for multiple cubicles for administrative personnel. See 3.2.3.2 Allocation Table for requirements.
- (v) Kitchenette/Break Room: Provide a countertop with both lower and upper storage cabinets (including shelves) with a double sink. Provide space for a microwave oven. Provide space for a full size refrigerator 28 in. wide. Provide seating space for a minimum of two 36 in. x 36 in. (or 36 in. diameter) tables with four chairs each and space for two vending machines.
- (w) Mechanical, Electrical, and Telecommunications Rooms: Mechanical rooms shall accommodate space for equipment maintenance/repair access without having to remove other equipment. Mechanical, electrical and telecommunications rooms shall be keyed separately for access by Installation maintenance personnel. First floor exterior access is required for centralized mechanical room. Refer to paragraphs 3.6 MECHANICAL REQUIREMENTS and 3.7 ELECTRICAL AND TELECOMMUNICATIONS REQUIREMENTS for additional information.

3.2.3.2. Space Allocation Table

		MINIMUM ET SQ FT		, -	_				
NAME	X-Sı	mall²	Sm	nall²	Med	lium²	Laı	ge²	
I WAME	Ea	Area	Ea	Area	Ea	Area	Ea	Area	
COMMANDER	1	120	1	120	1	120	1	120	
EXECUTIVE OFFICER	NR		NR		1	120	1	120	
SUPERVISORY CASE MGR	NR		NR		1	120	1	120	
CASE MANAGER	1	120	1	120	2	120	4	120	
FIRST SERGEANT	1	120	1	120	1	120	1	120	
PLATOON SERGEANT	2	120	2	120	3	120	3	120	
SQUAD LEADER	3	140	4	140	6	140	6	140	
SOCIAL WORKER	1	120	1	120	NR		NR	, , , ,	
NURSE CASE MANAGER	2	120	3	120	4	120	8	120	
EXTRA OFFICE	NR	120	2	120	NR	120	NR	,	
MEDICAL NCO - See Note 1	1	48	1	48	NR		1	48	
TRAINING SPECIALIST-	•	40	•	10	1414		•	70	
See Note 1	1	48	2	48	2	48	2	48	
OCCUPATIONAL									
THERAPY ASST- See Note 1	1	48	1	48	1	48	1	48	
FINANCIAL TECH SPEC -									
See Note 1	1	48	2	48	1	48	2	48	
MEDICAL SUPPORT ASST- See Note 1	1	48	2	48	1	48	2	48	
SUPPLY TECHNICIAN - See	'	40		70	<u>'</u>	40		70	
Note 1	1	48	1	48	2	48	1	48	
HR SPECIALIST- See Note 1	1	48	2	48	1	48	2	48	
HR ASSISTANT- See Note 1	NR		NR		3	48	NR		
FAMILY READINESS									
SUPPORT ASST- See Note 1	1	48	1	48	1	48	1	48	
COPIER & FAX	1	100	1	100	1	100	1	100	
KITCHENNETTE / BREAK									
ROOM	1	100	1	100	1	100	1	100	
RECORDS ROOM	1	100	1	100	1	100	1	100	
DISTRIBUTION CENTER	1	110	1	110	1	110	1	110	
CONFERENCE ROOM	1	250	1	250	1	250	1	250	
SUPPLY ROOM	1	100	1	100	1	100	1	100	
RECEPTION / WAITING ROOM	4	250	4	250	4	250	4	250	
JANITOR'S CLOSET	1	250	1	20	1	250	1	40	
BUILDING SUPPORT	1	20	1	<u> </u> 20	1	40	1	40	
AREAS (Restrooms,									
Mechanical,	As no	eeded	As no	eeded	As ne	eeded	As no	eeded	
Telecommunications,									
Electrical, etc									

NR - No Requirement

Notes:

- (1) Collocated in "open office" area (cubicles).
- (2) Numbers in table are per company.
- (3) One per facility when multiple CoHQs are combined

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3.2.4. BnHQ

3.2.4.1. Functional Space Requirements

- (a) Battalion Commander: Provide a private administrative office.
- (b) Executive Officer: Provide a private administrative office.
- (c) Command Sergeant Major: Provide a private administrative office.
- (d) Lawyer: Provide a private administrative office.
- (e) Para-Legal: Provide a private administrative office.
- (f) Chaplain: Provide a private administrative office.
- (g) Copier and Fax Room: Self explanatory.
- (h) Social worker: Provide a private administrative office.
- (i) Operations Sergeant: Provide a private administrative office.
- (j) Occupational Therapist: Provide a private administrative office.
- (k) Open Office Area: Provide space for multiple cubicles for administrative personnel. See 3.2.4.2 Space Allocation Table for requirements.
- (I) Conference Room: Self explanatory.
- (m) Storage Room: Provide a storage room for miscellaneous administrative items.
- (n) SIPRNET Room: Construct room in accordance with AR 380-5, Section III, Chapter 7, Department of the Army Information Security Program. Locate room adjacent to main telecommunications room with direct interior access into room. See paragraph 3.7 ELECTRICAL AND TELECOMMUNICATIONS requirements for additional requirements.
- (o) S1 Office: Provide a private administrative office.
- (p) S3 Office: Provide a private administrative office.
- (g) S4 Office: Provide a private administrative office.
- (r) Men's Restrooms: Provide toilet facilities and one shower and stall to serve the public and administrative personnel assigned to the building. Provide a dressing area with a built-in 18 in. wooden bench adjacent to the shower stall.
- (s) Women's Restrooms: Provide toilet facilities and one shower and stall to serve the public and administrative personnel assigned to the building. Provide a dressing area with a built-in 18 in. wooden bench adjacent to the shower stall.
- (t) Janitor Closet: Provide with a 10 in. deep floor mounted stainless steel mop sink with hot and cold service faucet, a four holder mop rack, and two 18 in. deep by 48 in. long heavy duty stainless steel shelves for storage of cleaning supplies. Provide space for storage of buckets and a vacuum.
- (u) Reception/Waiting Room: Provide a vestibule between the exterior and the reception/waiting room. Provide a minimum of 7 feet clearance between doors. Provide a means for the doors to open automatically via a sensor or push button. Provide a reception station consisting of a built-in reception counter for one person. Reception counter shall be capable of serving both able and disabled personnel.
- (v) Break Room: Provide a break room with kitchenette. Provide a countertop with both lower and upper storage cabinets (including shelves) with a double sink. Provide space for a microwave oven. Provide space for a full size refrigerator 28 in. wide. Provide seating space for a minimum of two 36 in. x 36 in. (or 36 in. diameter) tables with four chairs each and space for two vending machines.
- (w) Interior Corridors: Provide 6 feet minimum wide interior corridors.
- (x) Mechanical, Electrical, and Telecommunications Rooms: Mechanical rooms shall accommodate space for equipment maintenance/repair access without having to remove other equipment. Mechanical, electrical and telecommunications rooms shall be keyed separately for access by Installation maintenance personnel. First floor exterior access is required for centralized mechanical room. Refer to paragraphs 3.6 MECHANICAL REQUIREMENTS and 3.7 ELECTRICAL AND TELECOMMUNICATIONS REQUIREMENTS for additional information.

3.2.4.2. Space Allocation Table

BnHQ MINIMUM AREA REQUIREMENTS							
NET SQUARE FEET (NSF) PER ROOM							
ROOM	EA.	AREA					
BATTALION COMMANDER	1	200					
EXECUTIVE OFFICER	1	120					
CHAPLAIN	1	140					
LAWYER	1	120					
PARA-LEGAL	1	120					
S1	1	120					
S3	1	120					
S4	1	120					
COMMAND SERGEANT MAJOR	1	200					
OPERATIONS SERGEANT	1	120					
SOCIAL WORKER	6	120					
OCCUPATIONAL THERAPIST	1	120					
OPEN OFFICES: See Note 1							
• CHAPLAIN ASSISTANT	1	48					
• DRIVER	1	48					
• IT SPECIALIST	1	48					
• FINANCIAL MANAGEMENT SPECIALIST	1	48					
 SUPERVISORY MEDICAL SUPPORT ASSISTANT 	1	48					
• SUPPLY SPECIALIST	1	48					
• HR SPECIALIST	1	48					
• FAMILY READINESS SUPPORT ASSISTANT	1	48					
SIPRNET ROOM	1	AS REQ'D.					
RECORDS ROOM	1	100					
SUPPLY ROOM	1	100					
GENERAL STORAGE ROOM	1	150					
SECURE DOCUMENT STORAGE	1	150					
COPIER AND FAX	1	100					
BREAK ROOM	1	195					
CONFERENCE ROOM	1	500					
RECEPTION/WAITING ROOM	1	250					
JANITOR CLOSET	1	20					
BUILDING SUPPORT AREAS (Mechanical, Communications, Electrical, & Restrooms, etc.) AS NEEDED							

Notes:

Collocate in "open office" area (cubicles)

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3.2.5. SFAC

3.2.5.1. Functional Space Requirements

(a) Reception Area: Provide a large waiting/lounge area immediately adjacent to building entry. The large space will be used as a social interaction space for soldiers and their families. It will also serve as a waiting room for soldiers/families waiting to be assisted by staff members in the administrative areas. Provide a welcoming and warm atmosphere for soldiers and family members">Amend 1>for soldiers and family members, with a visual connection to the outside covered patio. Provide 2 a built-in reception desks for 2 people. One adjacent to administrative office area and the other adjacent to the Elevator Lobby. Reception desk shall be able to oversee operations around the reception area. Reception desks/serving counter must be ABA compliant. Include base cabinets and area for a computer at the service counters. Provide the following at the reception desk adjacent to the Elevator Lobby: approximately 14' (LF) of base cabinets with drawers with counter for printer, approximately 6' (LF) of upper cabinets for storage, and an 8' W x 4' H tack board behind the counter. /Amend 1>

Provide and install a wall mounting kit for a Flat Screen TV to include power and communication cables. Mounting kit location shall be coordinated with the furniture layout and placement finalized during design. Provide space for an ATM kiosk located within the reception area. The kiosk shall be within visual control of the reception desk. Provide a dual height electric water cooler in the vicinity of the public restrooms. The exterior covered patio area shall have room for tables and chairs. Provide a vestibule between the exterior and the reception area. Provide a minimum of 7 feet clearance between interior and exterior doors. Provide a means for the vestibule doors to open automatically via a sensor or push button.

- (b) Public Computer Access Room: Provide chair-height counter space along room perimeter to accommodate 10 chairs for personnel utilizing individual personal computers. Provide a space, power receptacle and network connectivity for a printer to serve the computers in this room.
- (c) Multi-Use/Conference Room: Provide a room for social gatherings and conferences. Provide a minimum 100 NSF chair storage room accessible from within the multi-use/conference room.
- (d) Nourishment Center: Provide a nourishment center that will serve as a snack bar / food preparation and serving area. Provide a built-in countertop with under/overhead storage cabinets (including shelves), a standard size CFCI under the counter dishwasher, space for a GFGI standard size residential oven/4-burner range combo 30 in. wide with hooded exhaust, double stainless steel sink with garbage disposal, shelf for a GFGI microwave, space for a GFGI full size refrigerator 28 in. wide. Provide space for a minimum of two GFGI vending machines and trash/recycle receptacles.
- (e) Provide private and open offices for staff as outlined in 3.2.5.2 Space Allocation Table.
- (f) Child Activity Room and Exterior Playground: Provide a room for child activities for different age groups. mainly infants and toddlers. Room shall have its own restrooms designed for each age group population. Provide one diaper changing station measuring 35 1/4" H x 60 1/2" W x 24" D minimum with a sink and storage for fourteen (14) underneath storage trays. An exhaust fan is required at the diaper changing station capable of exhausting 100 – 150 cfm. The diaper changing table shall have and integral 6" lip to prevent infant from rolling off and an unbreakable mirror installed along the back wall. The sink at the diaper changing station shall have a Goose-neck faucet with wrist blade handles. Retractable stairs which lock into place are also required. Provide one food preparation area with space for full size refrigerator 30 in. wide, built-in solid surface countertop with microwave, two separate stainless steel sinks and upper and lower cabinets. Provide a built-in sign-in desk located immediately inside the room entrance with power and a data port (See drawings in Appendix J). The built-in desk shall be a minimum of 4 feet long and must contain a lockable coat closet to store coats and personal items. Provide storage cubicles for a population of 24 children and adequate storage shelving for books, magazines, toys, etc. See drawings in Appendix J. Provide a doorbell button in the reception area adjacent to the door leading into the child activity room. Doorbell shall be located inside the child activity room and shall be audible throughout the entire room. Interior door into activity room shall not be capable of being opened by guests within the reception area. See paragraph 3.3 SITE REQUIREMENTS for playground requirements.
- (g) Men's Restrooms: Provide toilet facilities to serve the public and administrative personnel assigned to the SFAC.
- (h) Women's Restrooms: Provide toilet facilities to serve the public and administrative personnel assigned to the SFAC.

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- (i) Janitor Closet: Provide with a 10 in. deep floor mounted stainless steel mop sink with hot and cold service faucet, a four holder mop rack, and two 18 in. deep by 48 in. long heavy duty stainless steel shelves for storage of cleaning supplies. Provide space for storage of buckets and a vacuum.
- (j) Interior Corridors: Provide 6 feet minimum wide interior corridors.
- (k) Mechanical, Electrical, and Telecommunications Rooms: Mechanical rooms shall accommodate space for equipment maintenance/repair access without having to remove other equipment. Mechanical, electrical and telecommunications rooms shall be keyed separately for access by Installation maintenance personnel. Refer to paragraphs 3.6 MECHANICAL REQUIREMENTS and 3.7 ELECTRICAL AND TELECOMMUNICATIONS REQUIREMENTS for additional information.
- (I) Camera Room: Provide a room for a video monitoring security equipment rack. Rack is 36 in. wide by 30 in. deep by 84 in. high. Provide 3 feet working clearance behind rack. Provide 2 feet working clearance on at least one side and in front of rack. Space shall be conditioned with same equipment required for the telecommunications room.
- (m) The wall perpendicular to the diaper changing station shall be no more than 54 inches high from the finished floor. There shall be no door at the entrance to the pre-toddler/toddler toilet to allow supervision from the caregiver.

3.2.5.2. Space Allocation Table

SFAC MINIMUM AREA RE NET SQUARE FEET (NSF	• -	_					
NAME	S	MALL	1	LARGE			
RECEPTION AREA	1	,650		2,760			
PUBLIC COMPUTER ACCESS		160	240				
MULTI-USE/CONFERENCE ROOM W/ CHAIR STORAGE	450	(400/50)	109	1095 (1000/95)			
NOURISHMENT CENTER		195		450			
CHILD ACTIVITY ROOM		870		1,400			
STORAGE ROOM		N/A		140			
EXTERIOR COURTYARD - SEE NOTE 1		500		800			
BUILDING SUPPORT AREAS (Cam Room, Mechanical, Communications, Electrical, & Restrooms, etc.)	ASI	NEEDED	AS	NEEDED			
ADMINISTRATIVE O	FFICES						
OFFICE	QTY		QTY				
DIRECTOR	1	140	1	140			
FAMILY SUPPORT	1	160	1	230			
DISTRIBUTION CENTER	1	140	1	260			
STORAGE ROOM	1	140	1	140			
STORAGE ROOM			1	40			
SOCIAL SERVICES ASSISTANT	1	140	1	140			
VOLUNTEER	1	140	-	•			
CHAPLAIN	1	140	1	140			
TRANSITIONAL EMPLOYMENT	-	•	1	140			
DFAS	-	-	2	140			
DFAS/TRANSITIONAL EMPLOYMENT	1	140	-	-			
MILITARY BENEFITS/ID PROCESSING	1	140	1	140			
MILITARY BENEFITS	-	-	1	140			
EDUCATION	1	140	2	140			
VA	-	-	1	140			
TSGLI	-	-	1	140			
AW2	-	-	1	140			
OUTREACH	-	-	1	140			
ACS I & R (INFO EXPL)	-	-	1	140			
FINANCIAL COUNSEL	-	-	1	140			
OPEN OFFICES (CUE	BICLES)					
NCOIC	-	-	1	64			
ADMINISTRATION	-	-	1	64			
LEGAL	-	-	1	64			
C & Y SERVICES	-	-	1	64			
CPAC	-	-	1	64			
VOLUNTEER	-	-	2	64			
OPEN	-	-	1	64			

Notes:

- (1) Areas shown are for roofed areas, courtyard may be larger as allowed by overall building area.
- (2) Director's Office shall be adjacent to the Reception waiting area and accessible to parents and visitors.

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Notes (Cont.):

- (3) Storage Room (140 sf) in the Large SFAC Reception Area (located behind the reception desk) shall be a conditioned space
- (4) Storage Room (140 sf) in the Large and Small SFAC Administrative Office area shall be a conditioned space.

3.3. SITE REQUIREMENTS

- 3.3.1. Walks: Construct pedestrian walks within the designated construction area and connect to existing sidewalks, where applicable.
- (a) The geometric design of walks for pedestrian circulation shall adhere to UFC 3-210-01A "Area Planning, Site Planning, and Design".
- (b) Sidewalks shall be a minimum of 6 feet wide. Sidewalks designed to support emergency vehicle traffic shall be a minimum of 20 feet wide per NFPA requirements. Sidewalks designed to support service vehicle traffic shall be a minimum of 10 feet wide. Construct walks paralleling buildings beyond the eave drip line and at least 5 feet from the foundation.
- (c) Construct non-vehicular pedestrian sidewalks of Portland Cement Concrete having a minimum nominal thickness of 4 inches. Design joint patterns uniformly, symmetrical, and in accordance with the American Association of State Highway and Transportation Officials (AASHTO) standards. For joints, do not exceed the length to width ratio of 1.25 for non-reinforced pavements.
- (d) Sidewalks designed to support emergency and service vehicle traffic will be considered roadway pavements and shall be designed to meet the AASHTO standards. Construct vehicular supported walks of Portland Cement Concrete having a minimum nominal thickness of 7 inches. Design joints uniformly, symmetrical, and in accordance with AASHTO standards. Do not exceed the length to width ratio of 1.25 for non-reinforced pavements.

3.3.2. Site Structures and Amenities

Dumpster Area: The Contractor shall locate, design, and construct the dumpster enclosure area(s) and screening. Dumpster screening shall be aesthetically and architecturally compatible with the building it serves and shall be designed in accordance with Installation Guidelines. Locate the dumpster areas in accordance with UFC 4-010-01 "DoD Minimum Antiterrorism Standards for Buildings". Position the GFGI dumpsters outside of restricted areas to allow for servicing activities.

Child Outdoor Play Area: The outdoor play area must meet guidelines contained in the Consumer Products Safety Commission (CPSC) Handbook for Public Playground Safety, the American Society for Testing Materials (ASTM) F-1487-93, UFC 3-210-04 Chapter 7 "Children's Outdoor Play Area, Child Safety Requirements for Outdoor Play Areas", and any ABA guidelines for Play Areas (www.access-board.gov).

Design and construct the play area within allotted programmed funds. The play area shall be a minimum 50 foot by 60 foot area surrounded by a 4 foot high vinyl coated chain-link security type fence. Provide a 3 foot wide gate to allow emergency egress. The gate shall allow keyed entry only and the exit from the playground shall have an adult controlled securing device. Cut off the fence bolts so no more than two threads are exposed and cover the end with plastic caps or silicone caulk. Install the bolts so that the threaded end faces away from the play area.

The play area shall contain four foot (4') wide trike paths/sidewalks, a minimum 12-foot by 12-foot (12' x12') shade structure, a hard surface area with a basketball goal, a composite play system for ages two to five, and benches for viewing each area. Also provide swings if space is available.

Provide a safety surface throughout all use zones and under all play equipment. The safety surface shall be a unitary or poured in place material. The safety surface in the swing zone shall be wood fiber, with approved rubber matting at the foot contact point underneath the swings. Provide a unitary safety surface beneath infant swings.

Provide landscaping. Poisonous plants, plants with thorns, and fruit bearing plants are not permitted.

Provide a frost/freeze protected hose bib 18 inches above finished grade with removable cut off handles and integral vacuum breakers.

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3.3.3. Site Functional Requirements

Travel Distance: The CoHQ shall be no more than 160 feet from the WT Barracks. The distance shall be measured based on a pedestrian's path of travel from an entrance of one building to the nearest entrance of the other building.

3.4. ARCHITECTURAL REQUIREMENTS

3.4.1. Hardware

- **3.4.1.1.** Non-Destructive Emergency Access System: Fire Department Secure Lock-Box: Furnish and install a Knox-Vault 4400 Series (Single Lock Model) mounted at each building exterior adjacent to the Main Entry.
- **3.4.1.2.** Finish Hardware: All requirements for hardware keying shall be coordinated with the Contracting Officer. Extension of the existing Installation keying system shall be provided. **Please refer to 6.5.3 for Keying System requirements.**

3.4.2. Special Acoustical Requirements

- **3.4.2.1.** Exterior walls and roof/floor/ceiling assemblies, doors, windows and interior partitions shall be designed to provide for attenuation of external noise sources such as airfields in accordance with applicable criteria. Provide sound insulation to meet a minimum rating of STC 42 at interior walls and floor/ceiling assemblies. At interior doors provide solid core wood doors in metal frame with sound insulation to meet a minimum rating of STC 25. In addition to the sound insulation required, video teleconferencing areas shall meet a Noise Criteria (NC) 30 rating in accordance with ASHRAE Fundamentals Handbook.
- **3.4.2.2.** Sound conditions and levels for interior spaces, due to the operation of mechanical and electrical systems and devices, shall not exceed levels as recommended by ASHRAE handbook criteria.

3.4.3. Exterior Design Objectives

Provide durable and easily maintainable materials. Do not use exterior materials that require periodic repainting or similar refinishing processes. Material exposed to weather shall be factory pre-finished, integrally colored or provided with intrinsic weathering finish.

- **3.4.3.1.** Exterior Walls: Where Exterior Insulation and Finish Systems (EIFS), or any other material except CMU or other Masonry material is used as exterior finish material, it shall be in conjunction with a CMU wainscot. EIFS shall be "high-impact" type and shall be "drainable" type.
- **3.4.3.2.** Roof: Minimum roof slope for membrane roof systems shall be 1/4 inch per foot.
- **3.4.3.3.** Trim and Flashing: Gutters, downspouts, and fascias shall be factory pre-finished metal and shall comply with SMACNA Architectural Sheet Metal Manual.
- **3.4.3.4.** Bird Habitat Mitigation: The Contractor shall provide details in the design necessary to eliminate the congregating and nesting of birds at, on, and in the facility.

3.4.3.5. Exterior Doors and Frames:

- (a) Main Entrance Doors: Provide aluminum storefront doors and frames with Architectural Class 1 anodized finish, fully glazed, with medium or wide stile for entry into lobbies or corridors. Framing systems shall have thermal-break design. Storefront systems shall comply with wind-load requirements of applicable codes and criteria including UFC 4-010-01.
- (b) Other exterior Doors: Provide galvanized insulated hollow metal exterior doors for entry to all spaces other than corridors, lobbies, or reception/waiting rooms. Doors and frames shall comply with ANSI A250.8/SDI 100. Doors shall be heavy duty (grade 2) insulated with 18-gage steel cladding; top edge closed flush; A60 galvannealed. Frames shall be 12-gauge, with continuously welded mitered corners and seamless face joints. Doors and frames shall be constructed of hot dipped zinc coated steel sheet, complying with ASTM A653, Commercial Steel, Type B, minimum A40 coating weight; factory primed. Fire-rated openings shall comply with

applicable codes, and the requirements of the labeling authority. Door and frame installation shall comply with applicable codes and criteria including UFC 4-010-01.

- **3.4.3.6.** Exterior Windows: Provide insulated, high efficiency window systems, with thermally broken frames complying with applicable codes and criteria including UFC 4-010-01. Curtain wall systems shall be capable of withstanding area wind loads, thermal and structural movement required by location and project requirements, and shall comply with applicable codes and criteria including UFC 4-010-01. Window sills shall be designed to discourage bird nesting.
- **3.4.3.7.** Exterior Louvers: Exterior louvers shall have bird screens and shall be designed to exclude wind-driven rain. Exterior louvers shall be made to withstand wind loads in accordance with the applicable codes. Wall louvers shall bear the Air Movement & Control Association (AMCA) International certified ratings program seal for air performance and water penetration in accordance with AMCA 500-D and AMCA 511. Louver finish shall be factory applied and color shall match adjacent finish.

3.4.4. Interior Design Objectives

Provide sustainable materials and furnishings that are easily maintained and replaced. Maximize use of daylighting. Provide interior surfaces that are easy to clean and light in color. Design WTUAS building(s) with an office ambience.

3.4.4.1. Not Used

- **3.4.4.2.** Bulletin Boards: Provide one bulletin board near the main entrance. Each bulletin board shall be 4 feet high and 6 feet wide and shall have a header panel and lockable, glazed doors.
- **3.4.4.3.** Corner Guards: Provide surface mounted, high impact resistant, integral color, snap-on type resilient corner guards, extending from floor to ceiling for wall and column outside corners in high traffic areas such as corridors, waiting areas, lobbies, conference and multi-purpose rooms. Factory fabricated end closure caps shall be furnished for top and bottom of surface mounted corner guards.
- **3.4.4.4.** Chair Rail: Chair rails shall be installed in areas prone to hi-impact use, such as corridors, waiting areas, lobbies, conference and multi-purpose rooms.
- **3.4.4.5.** Casework: Provide cabinets complying with Architectural Woodwork Institute Quality Standards. Countertops shall have waterfall front edge and integral coved backsplash.
- **3.4.4.6.** Fire Extinguisher Cabinets: Furnish and install fire extinguisher cabinets and mounting brackets as required by applicable codes and criteria.

3.4.4.7. Interior Doors and Frames:

- (1) Provide hollow metal doors, or flush solid core wood doors as required. All door frames shall be hollow metal.
- (2) Wood Doors: All doors shall be wood doors except noted otherwise Provide flush solid core wood doors conforming to WDMA I.S.-1A. Stile edges shall be non-finger jointed hardwood compatible with face veneer. Provide Architectural Woodwork Institute (AWI) Grade A hardwood face veneer for transparent finished doors.
- (3) Insulated Hollow Metal Doors: Comply with ANSI A250.8/SDI 100. Doors shall be minimum Level 2, physical performance Level B, Model 2; factory primed. Provide insulated hollow metal doors for utility rooms, storage rooms and bathrooms.
- (4) Hollow Metal Frames: Comply with ANSI A250.8/SDI 100. Frames shall be minimum Level 2, 16 gauge, with continuously welded mitered corners and seamless face joints; factory primed.
- (5) Fire-rated and Smoke Control Doors and Frames: Comply with applicable codes, criteria and requirements of labeling authority.
- (6) STC ratings shall be of the sound classification required and shall include the entire door and frame assembly.
- **3.4.4.8.** Window Treatment: Provide horizontal mini blinds at all exterior windows. Uniformity of window covering color and material shall be maintained to the maximum extent possible throughout each building.

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- **3.4.4.9.** Toilet Accessories: Furnish and install the items listed below and all other toilet accessories necessary for a complete and usable facility. All toilet accessories shall be Type 304 stainless steel with satin finish.
- (a) Public Toilets/Showers (WTUAS): Accessories shall include the following items.
- (1) Glass mirrors on stainless steel frame and shelf at each lavatory
- (2) Liquid soap dispenser at each lavatory
- (3) Combination recessed mounted paper-towel dispenser/waste receptacle
- (4) Sanitary napkin disposal at each female toilet/unisex toilet
- (5) Recessed mounted lockable double toilet paper holder at each water closet
- (6) Sanitary toilet seat cover dispenser one per toilet
- (7) Grab bars as required by ABAAG
- (8) Shower curtain rod curved extra heavy duty
- (9) Shower curtain white anti-bacterial nylon/vinyl fabric shower curtain shall completely close the shower stall width.
- (10) Soap dish built-in in shower
- (11) Robe hook adjacent to shower stall entry
- (b) Not Used
- (c) Public Toilets (SFAC): Toilet accessories shall conform to the requirements of the ABA and shall include, but are not limited to the following.
- (1) Glass mirrors on stainless steel frame and shelf at each lavatory
- (2) Liquid soap dispenser at each lavatory
- (3) Combination recessed mounted paper-towel dispenser/waste receptacle
- (4) Sanitary napkin disposal at each female toilet/unisex toilet
- (5) Recessed mounted lockable double toilet paper holder at each water closet
- (6) Sanitary toilet seat cover dispenser one per toilet
- (7) Grab bars as required by ABAAG
- (8) One Wall-mounted Diaper Changing Station
- **3.4.4.10.** Mold and Mildew Mitigation: The Designer of Record shall provide details in the design analysis and design showing steps taken to mitigate the potential growth of mold and mildew in the facility.
- **3.4.5. Finishes:** Finishes Designers are not limited to the minimum finishes listed in this paragraph and are encouraged to offer higher quality finishes
- 3.4.5.1. Minimum Paint Finish Requirements
- (a) All paints used shall be listed on the "Approved product list" of the Master Painters Institute, (MPI). Application criteria shall be as recommended by Master Painters Institute (MPI) guide specifications for the substrate to be painted and the environmental conditions existing at the project site.
- (b) Exterior surfaces, except factory pre-finished material or exterior surfaces receiving other finishes shall be painted a minimum of one prime coat and two finish coats. Paints having a lead content over 0.06 percent by weight of nonvolatile content are unacceptable. Paints containing zinc-chromate, strontium-chromate, mercury or mercury compounds, confirmed or suspected human carcinogens shall not be used on this project. Exterior paints and coating products shall be classified as containing low volatile organic compounds (VOCs) in accordance with MPI criteria. Application criteria shall be as recommended by MPI guide specifications. Provide an MPI Gloss Level 5 Finish (Semi-gloss), unless otherwise specified.
- (c) Interior surfaces, except factory pre-finished material or interior surfaces receiving other finishes shall be painted a minimum of one prime coat and two finish coats. Paints having a lead content over 0.06 percent by weight of nonvolatile content are unacceptable. Paints containing zinc-chromate, strontium-chromate, mercury or mercury compounds, confirmed or suspected human carcinogens shall not be used on this project. Interior paints

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and coating products shall contain a maximum level of 150 g/l (grams per liter) of volatile organic compounds (VOCs) for non-flat coatings and 50 g/l of VOCs for flat coatings. Provide an MPI Gloss Level 5 Finish (Semigloss) in wet areas and a flat finish in all other areas.

3.4.5.2. Minimum Interior Finishes

- (a) Designers are not limited to finishes listed in the following INTERIOR FINISHES table(s) and are encouraged to offer higher quality finishes.
- (b) Wall, ceiling and floor finishes shall conform to the requirements of the IBC, NFPA and UFC 3-600-01. Where code requirements conflict, the most stringent code requirement shall apply.
- (c) Carpet shall be minimum of 2 yarn ply, modular tile conforming to ISO 2551, ASTM D 418, ASTM D 5793, ASTM D 5848, solution dyed, tufted, cut and loop pile, commercial 100% branded (federally registered trademark) nylon continuous filament. Vinyl composition tile (VCT) shall be minimum 1/8 inch thick, conforming to ASTM F 1066, Class 2, through pattern tile, Composition 1, asbestos free, with color and pattern uniformly distributed throughout the thickness of the tile.
- (d) Walls: All gypsum board shall achieve a score of 10, the highest level of performance for mold resistance under the ASTM D 3273 test method. All gypsum board shall be transported, handled, stored and installed in accordance with the GYPSUM ASSOCIATION Guidelines For Prevention Of Mold Growth On Gypsum Board (GA-238-03). Use impact resistant gypsum board in corridors, storage rooms, stairwells and activity rooms and centralized laundries (if centralized laundries are required by RFP).
- (e) Ceiling: All gypsum board shall achieve a score of 10, the highest level of performance for mold resistance under the ASTM D 3273 test method. All gypsum board shall be transported, handled, stored and installed in accordance with the GYPSUM ASSOCIATION Guidelines For Prevention Of Mold Growth On Gypsum Board (GA-238-03).

3.4.5.3. Not Used

3.4.5.4. CoHQ Interior Finishes

				С	oH0	J IN	TER	RIOF	R FII	<u>NIS</u>	<u>HES</u>						
	FLO	ORS		ı	1		BAS	E		WA	LLS			CEI	LING	1	REMARKS
		Y TILE						Y BASE		PAINT	UL.		UL .	PAINT	ILE .	INLESS	
	RESILIENT FLOORING	PORCELAIN OR QUARRY TILE	CERAMIC TILE	RECESSED ENTRY MAT	SEALED CONCRETE	CARPET	RESILIENT BASE	PORCELAIN OR QUARRY BASE	CERAMIC BASE	GYPSUM WALL BOARD-PAINT	LAMINATED GLASS, INSUL CURTAIN WALL SYSTEM	CERAMIC TILE	LAMINATED GLASS, INSUL STORE FRONT SYSTEM	GYPSUM WALL BOARD-PAINT	ACOUSTICAL CEILING TILE	MINIMUM HEIGHT 8'-0" UNLESS STATED OTHERWISE	REFER TO NOTE
COMMANDER						•	•			•					•		NOTE 5
SUPERVISORY CASE MANAGER						•	•			•					•		NOTE 5 NOTE 9
CASE MANAGER						•	•			•					•		
FIRST SERGEANT						•	•			•					•		NOTE 5
PLATOON SERGEANT	•						•			•					•		
SQUAD LEADER	•						•			•					•		
SOCIAL WORKER						•	•			•					•		NOTE 5
NURSE CASE MANAGER						•	•			•					•		NOTE 5
EXTRA OFFICE						•	•			•					•		NOTE 8
OPEN OFFICE AREA	•						•			•					•	9'	
COPIER AND FAX KITCHENETTE / BREAK ROOM	•						•			•					•		NOTE 3 AND 4
RECORDS ROOM	•						•			•					•		NOTE SAND 4
CONFERENCE ROOM						•	•										NOTE 5
SUPPLY ROOM	•						•										110120
RECEPTION/WAITING ROOM		•						•		•					•	9'	
<pre><amend 1=""> MESSAGE DISTRIBUTION CENTER </amend></pre>	•						•			•					•		
STORAGE ROOM	•						•			•					•		NOTE 10
MEN'S RESTROOM			•						•	•		•		•			NOTE 1 AND 3
WOMEN'S RESTROOM			•						•	•		•		•			NOTE 1 AND 3
JANITOR CLOSET			•						•	•		•		•			NOTE 2
CORRIDORS	•						•			•					•	9'	
VESTIBULES		•		•				•		•	•		•	•		9'	
STAIRS	•	_			•		•	•		•				•	_		NOTE 7
ELEVATOR		•			_			•		•					•		NOTE 11
PUMP ROOM					•		•			•				•		-	NOTE 11
MECHANICAL					•		•			•				•			NOTE 6
ELECTRICAL					•		•			•				•	•	10'	NOTE 6

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1. ALL WET WALLS IN TOILET ROOMS SHALL HAVE 4'-0" HIGH CERAMIC TILE WAINSCOT. ALL SHOWERS SHALL HAVE FULL HEIGHT TILE WALLS.

- 2. WALLS ADJACENT TO JANITOR'S SINK SHALL HAVE A 4'-0" HIGH CERAMIC TILE WAINSCOT.
- 3. ALL COUNTERS SHALL HAVE A MINIMUM OF 4" HIGH BACKSPLASH.
- 4. IN VENDING OR RECYCLABLES STORAGE AREA, MATCH FLOORING, WALL, AND CEILING FINISHES TO THOSE OF ADJACENT AREA.
- 5. EXTEND PARTITIONS TO DECK. PROVIDE SOUND INSULATION TO MEET A MINIMUM RATING AT DOORS AND WALLS OF STC 49.
- 6. CEILING MAY BE PAINTED EXPOSED STRUCTURE IF ALLOWED BY APPLICABLE CODE.
- 7. RISERS SHALL BE PAINTED STEEL. STAIR LANDINGS AND TREADS SHALL HAVE RESILIENT FLOORING OR SEALED CONCRETE. PROVIDE TREADS WITH SLIP RESISTANT NOSING.
- 8. ONLY USED ON SMALL CoHQ
- 9. USED ON ALL MEDIUM AND LARGE CoHQs.
- 10. ONLY USED ON MEDIUM DUPLEX CoHQ.
- 11. USED ONLY ON MEDIUM STACKED AND LARGE STACKED CoHQs.

3.4.5.5. BnHQ Interior Finishes

				В	nHC	NI Ç	TEF	RIOF	R FII	NIS	HES						
	FLO	ORS		ı	ı	ı	BAS	E	1	WA	LLS			CEI	LING		REMARKS
	RESILIENT FLOORING	PORCELAIN OR QUARRY TILE	CERAMIC TILE	RECESSED ENTRY MAT	SEALED CONCRETE	CARPET	RESILIENT BASE	PORCELAIN OR QUARRY BASE	CERAMIC BASE	GYPSUM WALL BOARD-PAINT	LAMINATED GLASS, INSUL. CURTAIN WALL SYSTEM	CERAMIC TILE	LAMINATED GLASS, INSUL . STORE FRONT SYSTEM	GYPSUM WALL BOARD-PAINT	ACOUSTICAL CEILING TILE	MINIMUM HEIGHT 8'-0" UNLESS STATED OTHERWISE	REFER TO NOTE
BATTALION COMMANDER						•	•			•					•		NOTE 5
EXECUTIVE OFFICER						•	•			•					•		NOTES
CHAPLAIN						•	•			•					•		NOTE 5
LAWYER						•	•			•					•		NOTE 5
PARA-LEGAL						•	•			•					•		NOTE 5
S1						•	•			•					•		
S 3						•	•			•					•		
S4						•	•			•					•		
COMMAND SERGEANT MAJOR						•	•			•					•		NOTE 5
OPERATIONS SERGEANT						•	•			•					•		
SOCIAL WORKER						•	•			•					•		NOTE 5
OCCUPATIONAL THERAPIST						•	•			•					•		NOTE 5
OPEN OFFICE AREA	•						•			•					•	9'	
STORAGE ROOM	•						•			•					•		
COPIER AND FAX	•						•			•					•		
BREAKROOM	•						•			•					•		NOTES 3 AND 4
CONFERENCE ROOM						•	•			•					•		NOTE 5
RECEPTION/WAITING ROOM		•						•		•					•	9'	
JANITOR CLOSET			•						•	•		•		•			NOTE 2
MEN'S RESTROOM			•						•	•		•		•			NOTES 1 AND 3
WOMEN'S RESTROOM			•						•	•		•		•			NOTES 1 AND 3
OFFICE CORRIDORS	•						•			•					•	9'	
VESTIBULES		•		•				•			•		•	•		9'	
MECHANICAL					•		•			•				•			NOTE 6
ELECTRICAL					•		•			•				•			NOTE 6
TELECOMM					•		•			•					•	10'	
SIPRNET ROOM					•		•			•				•		9'	NOTE 7

^{1.} ALL WET WALLS IN TOILET ROOMS SHALL HAVE 4'-0" HIGH CERAMIC TILE WAINSCOT. ALL SHOWERS SHALL HAVE FULL HEIGHT TILE WALLS.

^{2.} WALLS ADJACENT TO JANITOR'S SINK SHALL HAVE A 4'-0" HIGH CERAMIC TILE WAINSCOT.

^{3.} ALL COUNTERS SHALL HAVE A MINIMUM OF 4" HIGH BACKSPLASH.

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- 4. IN VENDING OR RECYCLABLES STORAGE AREA, MATCH FLOORING, WALL, AND CEILING FINISHES TO THOSE OF ADJACENT AREA.
- 5. EXTEND PARTITIONS TO DECK. PROVIDE SOUND INSULATION TO MEET A MINIMUM RATING AT DOORS AND WALLS OF STC 49.
- 6. CEILING MAY BE PAINTED EXPOSED STRUCTURE IF ALLOWED BY APPLICABLE CODE.
- 7. CONSTRUCT IN ACCORDANCE WITH AR 380-5, SECTION III, CHAPTER 7.

3.4.5.6. SFAC Interior Finishes

Finishes shall be coordinated through the United States Army Corps of Engineers Center of Standardization to ensure use of therapeutic colors, flooring material, and countertop textures.

The Contact address is: Corps of Engineers – Ft Worth District CESWF-EC-DA 819 Taylor Street Room 4A05 Fort Worth, TX 76102

					SF	AC	INTI	ERIC	ORS	FIN	NISH	HES							
	FLO	ORS					BAS	SE			١	WALL	.S		CEI	LING			REMARKS
	RESILIENT FLOORING	PORCELAIN TILE	RUBBER FLOORING	RECESSED ENTRY MAT	SEALED CONCRETE	CARPET	RESILIENT BASE	WOOD BASE	CERAMIC BASE	GYPSUM WALL BOARD - PAINT	WOOD VENEER WALL COVERING	CERAMIC TILE	VENEER STONE WALL FINISH	LAMINATED GLASS, INSUL. STORE FRONT SYSTEM	GYPSUM WALL BOARD-PAINT	ACOUSTICAL CEILING TILE	LAY-IN WOOD TILE	MINIMUM-HEIGHT 8'-0" UNLESS STATED OTHERWISE	REFER TO NOTE
PUBLIC & SUPPOR	T SP	ACE	S																
RECEPTION AREA						•	•			•	•		•		•	•	•		
PUBLIC COMPUTER ACCESS						•	•			•						•			
MULTI- USE/CONFERENCE ROOM W/STORAGE						•	•			•					•	•			
NOURISHMENT CENTER		•						•		•					•				
CHILD ACTIVITY ROOM	•		•				•			•					•	•			
STORAGE ROOM						•	•			•					•				
MEN'S RESTROOM		•							•			•			•				
WOMEN'S RESTROOM		•							•			•			•				
TOILET		•							•			•			•				
JANITOR CLOSET		•							•	•		•			•				NOTE 5
MECHANICAL					•		•			•					•				NOTES 3 & 4
ELECTRICAL					•		•			•					•				NOTES 3 & 4
TELECOMM					•		•			•					•			10'	
CAM ROOM					•		•			•					•				

DIRECTOR				•	•	•				•	
FAMILY SUPPORT				•	•	•				•	
DISTRIBUTION CENTER				•	•	•				•	
STORAGE ROOM				•	•	•			•		
SOCIAL SERVICES ASST.				•	•	•				•	
VOLUNTEER				•	•	•				•	NOTE 1
CHAPLAIN				•	•	•				•	
TRANSITIONAL EMPLOYMENT				•	•	•				•	NOTE 2
DFAS				•	•	•				•	NOTE 2
DFAS/TRANSITIONAL EMPLOYMENT				•	•	•				•	<amend 1=""> Note 1 </amend>
MILITARY BENEFITS/ID PROCESSING				•	•	•				•	
MILITARY BENEFITS				•	•	•				•	NOTE 2
EDUCATION				•	•	•				•	
VA				•	•	•				•	NOTE 2
TSGLI				•	•	•				•	NOTE 2
AW2				•	•	•				•	NOTE 2
OUTREACH				•	•	•				•	NOTE 2
ACS I & R (INFO EXPL)				•	•	•				•	NOTE 2
FINANCIAL COUNSEL				•	•	•				•	NOTE 2
ADMINISTRATIVE OPEN	OFFICE	S	•		•			•	•		
NCOIC				•	•	•				•	NOTE 2
ADMINISTRATION				•	•	•				•	NOTE 2
LEGAL				•	•	•				•	NOTE 2
C & Y SERVICES				•	•	•				•	NOTE 2
CPAC				•	•	•				•	NOTE 2
VOLUNTEER				•	•	•				•	NOTE 2
OPEN				•	•	•				•	NOTE 2

Notes:

- 1. ONLY USED IN SMALL SFAC
- 2. ONLY USED IN LARGE SFAC
- 3. WALL PAINT TO BE WATER-BASED EPOXY
- 4. CEILINGS MAY BE PAINTED EXPOSED STRUCTURE IF ALLOWED BY APPLICABLE CODE
- 5. WALLS ADJACENT TO JANITOR'S SINK SHALL HAVE A 4"-0" HIGH CERAMIC TILE WAINSCOT

3.4.5.7. Not Used

3.4.5.8. Not Used

3.4.5.9. CoHQ Furniture Chart

	CoHQ FURN	NITURE CHART
Description	Comments	Furniture Required
Commander	Private Office	U-shaped executive desk with 2 pedestals, hutch, one 4-drawer lateral file, 2 guest chairs, 1 executive chair
Executive Officer	Private Office	L-shaped double pedestal desk unit, hutch, one 4-drawer lateral file, 2 guest chairs, 1 task chair
First Sergeant	Private Office	L-shaped double pedestal desk unit, hutch, two 4-drawer lateral files, 2 guest chairs, 1 executive chair
Office 1 (See note 1)	Private Office	L-shaped double pedestal desk unit, hutch, two 4-drawer lateral files, 2 guest chairs, 1 task chair
Platoon Sergeant	Shared Office	2 L-shaped modular furniture workstations with work surfaces, file pedestals, and overhead storage, one 4-drawer lateral files, 2 task chairs, 2 guest chairs
Squad Leaders	Shared Office	3 single pedestal desks, 3 task chairs, 3 guest chairs
Open Office (See note 2)	48 NSF Open Workstations	6 x 8 systems furniture workstation with work surfaces, file pedestals, and overhead storage, 1 task chair, 1 guest chair, room enough for wheelchair access into cubical
Conference Room	Commander's Conference Room	Boat-shaped conference table, 12 conference chairs, minimum of 4 side chairs, 1 small storage credenza
Copier and Fax	Copy Room with Fax Machine	1 work surface with storage for paper
Records Room	Storage	Minimum of five 4-drawer lateral files
Supply Room	Storage	Minimum of 80 linear feet of shelving, Minimum of 1 locking cabinet
Reception/Waiting Room	Building Reception and Waiting Area	1 reception station with task chair(s), minimum of 10 lobby seats with side tables.

Notes:

- (1) Office 1 layout applies to Case manager, Nurse Case manager, Social Worker, Extra Office and Supervisor Case Manager.
- (2) Open Office workstations apply to Occupational Therapy Assistant, Medical NCO, Financial Tech. Specialist, Training Specialist, Medical Support Assistant, Supply Technician, HR Specialist, HR Assistant and Family Readiness Support Assistant.

3.4.5.10. BnHQ Furniture Chart

	BnHQ FURN	ITURE CHART
Description	Comments	Furniture Required
Battalion Commander	Private Office	L-shaped executive desk with 2 pedestals, two 4-drawer lateral files, 1 conference table, 4 conference chairs, 2 guest chairs, 1 executive chair
Executive Officer, Command Sergeant Major	Private Offices	Each office to accommodate L-shaped executive desk with 2 pedestals, one 4-drawer lateral file, 1 book case, 2 guest chairs, 1 managerial chair
Office 1 (See note1)	Private Office	L-shaped executive desk with 2 pedestals, 1 double pedestal credenza, hutch, one 4-drawer lateral file, 2 guest chairs, 1 managerial chair
Chaplain	Private Office	L-shaped executive desk with 2 pedestals, hutch, one 4-drawer lateral file, 1 guest chair, one 3-seat upholstered arrangement, 1 managerial chair
Open Office (See note 2)	48 NSF Open Workstations	6 x 8 systems furniture workstation with work surfaces, file pedestals, and overhead storage, 1 task chair, 1 guest chair, room enough for wheelchair access into cubical
Conference Room	Commander's Conference Room	Boat-shaped conference table, 16 conference chairs, 16 side chairs, 1 small storage credenza
Reception/Waiting Room	Building Reception and Waiting Area	1 reception station with task chair, minimum of 12 guest chairs and 5 side tables
Break Room	Kitchenette	2 square tables, 4 stackable chairs
Copier and Fax	Copy Room with Fax Machine	work surface with lockable storage for paper products
Storage Room	General Storage	Minimum of 80 linear feet of shelving, Minimum of 1 locking cabinet

Notes:

- (1) Office 1 layout applies to S-1, S-3, S-4, Operations Sergeant, Occupational Therapist and Social Worker, Lawyer and Para-Legal.
- (2) Open Office workstations apply to IT Specialist, Financial Management Specialist, Supply Specialist, Supervisory Medical Support Assistant, HR Specialist, Family Readiness Support Assistant, Chaplain Assistant and Driver.

3.4.5.11. SFAC Furniture Chart

	SFAC FURNITURE	CHART (See note 1)
Description	Comments	Furniture Required
Office (See note 2)	Private Office	L-shaped systems furniture workstation with 1 pedestal, one 2-drawer lateral file, 2 guest chairs, 1 executive chair
Open Office-Large Only (See note 3)	48 NSF Open Workstations	6 x 8 systems furniture workstation with work surfaces, 2 file pedestals, and overhead storage, 1 task chair, 1 guest chair, room enough for wheelchair access into cubical
Family Support-Small	Private Lounge	One 3-seat upholstered arrangement, one 2-seat upholstered arrangement, 1 upholstered chair, 1 side table, 1 computer table
Family Support-Large	Private Lounge	One 3-seat upholstered arrangement, one 2-seat upholstered arrangement, 2 upholstered chairs, 2 side tables, 1 computer table
Nourishment Center- Small	Food prep area	3 round tables, 6 chairs
Nourishment Center- Large	Food prep area	3 round tables, 10 chairs
Multi-Use/Conference Room-Small	Conference Room	Six 30"x60" training tables, 16 conference chairs, one 24"x75" credenza
Multi-Use/Conference Room-Large	Conference Room	Eight 30"x60" training tables, 20 conference chairs, one 24"x75" credenza
Reception Area-Small	Reception/waiting/dining	Two 3-seat upholstered arrangement, one 2-seat upholstered arrangement, 5 upholstered chairs, 4 side tables, 2 sofa tables, 1 coffee table, 3 round dining tables, 6 dining chairs, U-shaped reception station with work surface, 2 file pedestals, and overhead storage, transaction top, 2 task chairs.
Reception Area-Large	Reception/waiting/dining	Two 3-seat upholstered arrangement, two 2-seat upholstered arrangement, 15 upholstered chairs, 11 side tables, 1 sofa table, 3 round dining tables, 10 dining chairs, L-shaped reception station, with work surface, 2 file pedestals, and overhead storage, transaction top, 2 task chairs.
Public Computer Access	Computer Room	6 task chairs
Courtyard-Small	Open-air dining	7 round tables, 28 chairs
Courtyard-Large	Open-air dining	10 round tables, 29 chairs
General Storage-Small	Storage	Minimum of 162 total linear feet of wire shelving; two 5-high lateral file cabinets and 1 lockable storage cabinet for main storage
General Storage-Large	Storage	Minimum of 90 total linear feet of wire shelving; two 5-high lateral file cabinets and 2 lockable storage cabinets for main storage
Distribution Center- Small	Storage	Minimum of 54 linear feet of wire shelving, two 5-drawer lateral file cabinets, 1 locking cabinet
Distribution Center- Large	Storage	Minimum of 90 linear feet of wire shelving, 3 locking storage cabinets, three 5-drawer lateral file cabinets, two 36" x 60" tables

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Notes:

- (1) Coordination with drawings necessary to verify room list per building.
- (2) Office layout applies to all hard wall offices. Coordinate with drawings, can include the following: Director, Family Support, Distribution Center, General Storage, Social Services Assistant, Volunteer, Pastoral, Transition Employment, DFAS, DFAS/Transition Employment, Military Benefits/ID Processing, Military Benefits, Education, VA, TSGLI, AW2, ACS I&R (Reception), ACS I & R (Info Expl) and/or Financial Counsel.
- (3) Open Office workstations apply to NCOIC, Administration, Legal, C&Y Services, CPAC, two Volunteers and Open.

3.5. STRUCTURAL REQUIREMENTS

Design and construct as a complete system in accordance with APPLICABLE CRITERIA.

Live Loads: Design live loads shall be per the IBC but not lower than the following minimums:

<Amend 1> Note that the minimum live loads indicated do not include partition loads. Partition live loads of 15 pounds per square foot (psf) shall be added to all areas with a live load of 80 psf or less.

(a) Elevated slabs 60 pounds per square foot (psf)

(b) Slabs on grade 150 psf

(c) Centralized laundry area 150 psf, but not less than actual equipment loads

3.6. MECHANICAL REQUIREMENTS

3.6.1. Plumbing

3.6.1.1. Not Used

3.6.1.2. Not Used

3.6.1.3. Not Used

3.6.1.4. Not Used

3.6.1.5. Not Used

- **3.6.1.6.** Urinals shall be non-water using (waterless, water-free, etc.) type.
- **3.6.1.7.** SFAC Provide sink for built-in diaper changing station with goose neck faucet and wrist blade handles.
- 3.6.1.7.1. Not Used
- **3.6.1.7.2.** For Child Activity Room pre-toddler/toddler toilet area, provide two pediatric water closets (10 inches to rim above finished floor (AFF)). Water closets shall not use automatic flush valves. Provide self-priming floor drain in toilet area. Provide two wall hung child size lavatories mounted 17 inches AFF. Lavatories shall be mounted opposite from water closets. For sinks in the toilet area (Not the sinks in the Food Prep area), faucets shall be pre-mixed single push control that meets ABA requirements. Water shall run for 15 seconds. Provide one bubbler water fountain, with guarded stream drinking head, outside pre-toddler/toddler toilet area. Bubbler shall be mounted 17 inches AFF.
- **3.6.1.7.3.** For Child Activity Room preschool/school-age children toilet area, provide one pediatric water closet (13 inches to rim above finished floor (AFF)). Water closet shall not use automatic flush valve. Provide self-priming floor drain in toilet area. Provide one wall hung child size lavatory mounted 20 inches AFF. For sinks in the toilet area (Not the sinks in the Food Prep area), faucets shall be pre-mixed single push control that meets ABA requirements. Water shall run for 15 seconds. Provide one bubbler water fountain, with guarded stream drinking head, outside preschool/school-age toilet area. Bubbler shall be mounted 20 inches AFF.

3.6.1.8. Not Used

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3.6.2. Heating, Ventilating and Air-Conditioning (HVAC)

3.6.2.1. Not Used

3.6.2.2. Not Used

3.6.2.3. Not Used

3.6.2.4. Not Used

3.6.2.5. Not Used

3.6.2.6. WTUAS or SFAC - All air handling units shall be located in mechanical rooms accessible only through an exterior door. Mechanical rooms shall be sized for ease of service, maintenance, and replacement of HVAC equipment. Air filters shall be located in the mechanical room. Occupant control shall also include ability to select heating or cooling mode. HVAC system shall be able to provide for year round heating.

Each conference and multi-purpose room shall be zoned separately. Other space zoning shall be based on exterior envelope exposures. Where VAV systems are used, limit individual zones to a maximum of 2,500 cfm.

Air handling units shall run continuously during occupied hours. Restroom exhaust fans shall be interlocked with the air handling units. Similarly, outdoor ventilation air required by ASHRAE 62.1 shall be continuous during occupied hours.

3.6.2.7. SFAC - Provide continuous exhaust above diaper changing station at a rate of 100-150 cfm.

3.6.2.8. Not Used

3.6.3. Fire Protection

Fire suppression systems shall be designed in accordance with the latest edition of UFC 3-600-01. All facilities as a part of the complex shall be protected throughout by a complete automatic sprinkler system.

3.6.4. Not Used

3.7. ELECTRICAL AND TELECOMMUNICATIONS REQUIREMENTS

Select electrical characteristics of the power system to provide a safe, efficient, and economical distribution of power based upon the size and types of loads to be served. Use distribution and utilization voltages of the highest level that is practical for the load to be served. The effect of nonlinear loads such as computers, other electronic equipment and electronic ballasts shall be considered and accommodated as necessary. Voltage drop shall not exceed the maximum allowed per ASHRAE 90.1. Transient voltage surge protection shall be provided on service equipment for WT Barracks, WTUASs, and SFACs.

3.7.1. Power

- **3.7.1.1.** Power shall be provided for all installed equipment requiring power including all government furnished contractor installed equipment and all GFGI equipment. Power poles are not allowed. The following shall also be provided.
- **3.7.1.1.1.** Provide 125-volt duplex receptacles per NFPA 70, in conjunction with the proposed equipment and furniture layouts, and as per other stated requirements elsewhere in the RFP.
- **3.7.1.1.2.** Each CATV outlet shall have a 125-volt duplex receptacle mounted adjacent to it.
- **3.7.1.1.3.** In addition to receptacles required elsewhere in the statement of work provide one 125-volt duplex receptacle per wall in all normally occupied spaces with the exception of WT barracks dwelling units.

- **3.7.1.1.4.** For housekeeping purposes provide a minimum of one 125-volt duplex receptacle per corridor. No point along corridor wall bottom shall be more than 25 feet from a receptacle.
- **3.7.1.1.5.** Provide 125-volt duplex receptacles adjacent to lavatories. Provide a minimum of one for every two adjacent lavatories. Each single lavatory shall also be provided a receptacle.
- **3.7.1.1.6.** Provide a minimum of two 125-volt duplex receptacles in each mechanical room in addition to those required per NFPA 70. In addition, provide a minimum of one receptacle in each electrical room.
- 3.7.1.2. Not Used
- 3.7.1.3. WTUAS
- **3.7.1.3.1.** Provide a minimum of two 125-volt duplex receptacles for each designated individual work space (cubicle) in all open office areas. One of which shall be adjacent to the telecommunications outlet.
- **3.7.1.3.2.** Provide two 125-volt duplex receptacles for the CQ workstation adjacent to the telecommunications outlet. Receptacles shall be on a dedicated circuit.
- **3.7.1.3.3.** For housekeeping purposes provide a minimum of one 125-volt duplex receptacle on each wall within reception/waiting room. No point along bottom of walls shall be more than 25 feet from a receptacle.
- **3.7.1.3.4.** Provide a 125-volt duplex receptacle above countertop on either side of the sink in kitchenette. These two receptacles shall be on a dedicated circuit. All remaining receptacles in room shall be on another dedicated circuit.
- **3.7.1.3.5.** Provide 125-volt duplex receptacles above countertop in break room such that no point along countertop is more than 4 feet from a receptacle.
- 3.7.1.4. SFAC
- **3.7.1.4.1.** Provide a 125-volt duplex receptacle adjacent to each data outlet in public computer access rooms.
- **3.7.1.4.2.** Provide 125-volt duplex receptacles above countertop in nourishment center and child activity room such that no point along countertop is more than 4 feet from a receptacle. In addition, provide a 125-volt duplex receptacle above sign-in countertop in child activity room and above shelf for microwave in Nourishment Center. Receptacles above countertop and above shelf in Nourishment Center shall be on a dedicated circuit.
- **3.7.1.4.3.** Provide two 125-volt duplex receptacles for the reception stations adjacent to the telecommunications outlet. Receptacles shall be on a dedicated circuit.
- **3.7.1.4.4.** Provide a minimum of four 125-volt duplex receptacles in **<Amend 1> Covered Patio** courtyard **</Amend 1>** area evenly spaced along perimeter walls.
- **3.7.1.4.5.** Provide a minimum of two 125-volt duplex receptacles in the **<Amend 1> Covered Patio** courtyard **</Amend 1>** mounted at eave height for decorative lighting.
- **3.7.1.4.6.** For housekeeping purposes provide a minimum of one 125-volt duplex receptacle on each wall within reception area. No point along bottom of reception area perimeter walls shall be more than 25 feet from a receptacle.
- **3.7.1.4.7.** Provide a minimum of five 125-volt duplex receptacles along the wall in the older children's area within the child activity room. Mount receptacles 54 in. above finished floor. Locate each receptacle adjacent to a telecommunications outlet.
- **3.7.1.4.8.** Provide a 125-volt duplex receptacle adjacent to the fireplace in the reception area in addition to the requirement stated in paragraph 3.7.1.4.6
- **3.7.1.4.9.** Provide two 125-volt quadraplex receptacles on the back wall of the cam room mounted 36 in. above finished floor. Receptacles shall be on a dedicated circuit.

- **3.7.1.4.10.** Provide a minimum of two 125-volt duplex receptacles for each designated individual work space (cubicle) in all open office areas one of which shall be adjacent to the telecommunications outlet.
- **3.7.1.4.11.** Provide a minimum of four floor recess mounted 125-volt duplex receptacles in the reception area. Receptacle locations shall be coordinated with the furniture layout and placement finalized during design.
- **3.7.1.4.12.** In addition to the receptacles required per the Technical Criteria for I3A in the distribution center, provide two dedicated circuits with a single power receptacle connected to each for copiers. Power requirements for these circuits will not be known until a copier is selected by the Installation during the design phase.
- **3.7.1.4.13.** Provide two 125-volt duplex receptacles in the storage room behind the reception counter, **<Amend 1> and** in the storage room adjacent to the **TRANS EMPL** AW2 office and in the storage room adjacent to the **TSGLI office.** Amend 1> Receptacles shall be placed on opposite walls and located adjacent to a dual jack telecommunications outlet.
- **3.7.1.4.14. <Amend 1>** Provide two 125-volt quadraplex receptacles on the back wall above the shelf of the Casework Area located adjacent to the TRANS EMPL office.**</Amend 1>**
- 3.7.1.5. Not Used

3.7.2. Grounding

Provide grounding in accordance with NFPA 70 and the Technical Criteria for I3A.

- 3.7.3. Lighting
- 3.7.3.1. General.
- **3.7.3.1.1.** Provide interior lighting controls in accordance with ASHRAE 90.1.
- **3.7.3.1.2.** Provide an illuminance level of 30 foot-candles in mechanical and electrical rooms.
- **3.7.3.1.3.** Compact fluorescent lamps of 12 watts or less shall not be used.
- 3.7.3.1.4. Electronic ballasts for linear fluorescent lamps shall be the high efficiency programmed start type.
- **3.7.3.1.5.** Provided lighting levels shall be within +/- 10% of required lighting levels.
- 3.7.3.2. Not Used
- **3.7.3.3.** WTUAS
- **3.7.3.3.1.** Local manual controls shall supplement automatic controls in restrooms, offices, open work spaces, reception/waiting room, and specialized areas such as conference rooms.
- **3.7.3.3.2.** Provide an illuminance level of 20 foot-candles in the reception and waiting area. Provide an illuminance level of 30 foot-candles on the CQ workstation in the reception/waiting room.
- **3.7.3.3.3.** Provide an illuminance level of 10 foot-candles in supply and records rooms. Provide automatic occupancy sensor detection switching for fixtures.
- **3.7.3.3.4.** Provide an illuminance level of 30 foot-candles in kitchenette. Provide automatic occupancy sensor detection switching for fixtures.
- **3.7.3.3.5.** Provide an illuminance level of 30 foot-candles in break room. Provide automatic occupancy sensor detection switching for fixtures.

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3.7.3.4. SFAC

- **3.7.3.4.1.** Local manual controls shall supplement automatic controls in restrooms, public computer access rooms, offices, open work spaces, reception area; and specialized areas such as multi-purpose use/conference rooms.
- **3.7.3.4.2.** Provide a minimum illuminance level of 1 foot-candle in **<Amend 1> Covered Patio area** courtyards. Decorative lighting fixtures are required. If poles are utilized they are not allowed to be over 10 feet tall. **</Amend 1>** Provide manual switching from inside the SFAC.
- **3.7.3.4.3.** Provide an illuminance level of 30 foot-candles in the child activity room. Lighting shall be compatible with security cameras to ensure area covered by each camera can be clearly seen on the reception monitor. Contractor shall coordinate camera type and location with the installation thru the contracting officer's representative.
- **3.7.3.4.4.** Provide an illuminance level of 20 foot-candles in the reception area. Provide an illuminance level of 30 foot-candles on reception **<Amend 1>** stations stations **<Amend 1>** within the reception area.
- **3.7.3.4.5.** Provide an illuminance level of 30 foot-candles in the public computer access room and nourishment center.
- 3.7.3.4.6. Provide an illuminance level of Amend > 30 40 /Amend> foot-candles in the distribution center.
- **3.7.3.4.7.** Provide separately switched accent lighting on the interior side of the fireplace.
- **3.7.3.4.8.** Provide an illuminance level of 50 foot-candles in the cam room.
- **3.7.3.4.9.** Provide an illuminance level of 30 foot-candles in the storage room behind the reception counter **<Amend 1>** and in the storage room adjacent to the **TRANS EMPL** AW2 office and in the storage room adjacent to the **TSGLI** office.**</Amend 1>** and in the storage room adjacent to the AW2 office.
- 3.7.3.5. Not Used

3.7.4. Telecommunications System

- **3.7.4.1.** Provide telecommunications outlets per applicable criteria based on functional purpose of the space within the building and in accordance with other provisions of this RFP. Provide voice and data connection capability to all workstations.
- 3.7.4.2. Not Used
- 3.7.4.3. WTUAS
- **3.7.4.3.1.** Provide one dual 8-pin modular jack outlet in the CQ workstation, two in the copier and fax room; one in the message center and one at the front of the conference room.
- **3.7.4.3.2.** Provide a dual 8-pin modular jack outlet at each designated individual work space (cubicle) in the open office area.
- 3.7.4.4. SFAC
- **3.7.4.4.1.** Provide six single 8-pin modular jack outlets for data connectivity in the public computer access room evenly spaced above counter.
- **3.7.4.4.2.** Provide a dual 8-pin modular jack outlet in the reception **<Amend 1>** stations station and at the front of the conference/multi-purpose use room. **</Amend 1>**
- **3.7.4.4.3.** Provide a dual 8-pin modular jack outlet above the sign-in countertop in the child activity room. Locate adjacent to duplex receptacle.

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- **3.7.4.4.4.** Provide a minimum of five single 8-pin modular jack (data) outlets along the wall in the older children's area within the child activity room. Locate each adjacent to a duplex receptacle.
- **3.7.4.4.5.** Provide necessary LAN connection for kiosk.
- **3.7.4.4.6.** Provide connectivity for two pay phones in vestibule. Coordinate requirements with local private telephone company.
- **3.7.4.4.7.** Provide a minimum of four dual 8-pin modular jack outlets in the distribution center.
- **3.7.4.4.8.** Provide two dual 8-pin modular jack outlets in the storage room behind the reception counter and in the storage room adjacent to the AW2 office. Locate adjacent to a duplex receptacle.
- **3.7.4.4.9.** Provide a dual 8-pin modular jack outlet at each designated individual work space (cubicle) in the open office area.
- 3.7.4.5. Not Used

3.7.5. Video Teleconferencing

Provide an outlet that has both a fiber optic jack and a coaxial jack to provide video teleconferencing connectivity in each conference room. Outlet shall have a 125-volt duplex receptacle mounted adjacent to it in accordance with the Technical Criteria for I3A.

3.7.6. CATV

All CATV outlet boxes, connectors, cabling, and cabinets shall conform to applicable criteria unless noted otherwise. All horizontal cabling shall be homerun from the CATV outlet to the nearest telecommunications room unless noted otherwise. See paragraph 6.0 PROJECT SPECIFIC REQUIREMENTS for possible additional requirements.

- 3.7.6.1. Not Used
- **3.7.6.2.** WTUAS
- **3.7.6.2.1.** Provide connectivity in conference rooms.
- **3.7.6.2.2.** Provide connectivity in reception/waiting room. Provide a minimum of two outlets.
- 3.7.6.3. SFAC
- 3.7.6.3.1. Provide connectivity in multi-use/conference room.
- **3.7.6.3.2.** Provide connectivity in child activity room and reception/waiting room. Provide a minimum of two outlets in each room.

3.7.7. Mass Notification

MNS shall be integrated into the installation's area wide MNS (Giant Voice). See paragraph 6 for possible additional requirements.

3.7.8. Secure Telecommunications

In the BnHQ, provide the same power, lighting, and telecommunications design features within the SIPRNET room as required for telecommunications rooms per the Technical Criteria for I3A with the exception of the cable tray. In addition, provide a 2 in. conduit between SIPRNET room and main telecommunications room.

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3.7.9. Observation Cameras Infrastructure (Cameras, CPU's and monitors not in contract)

The infrastructure shall be installed to support GFGI cameras, CPU'S and monitors. Cameras will be installed in child activity room and throughout the playground area to allow for observation of all areas within the room and playground. Cameras will also be installed within all storage areas accessible from within the child activity room. Location of GFGI cameras shall be coordinated with the installation thru the COR and approved by the Family and Morale Welfare and Recreation Command (FMWRC). CPU'S will be located on dedicated equipment racks within the camera room and observation monitors will be located in the reception/waiting room visible to both waiting personnel and the reception desk. A monitor will also be located in the open office area. Infrastructure shall consist of conduit, pull wire and outlet boxes to allow for interconnection of all system components.

3.7.10. Sound System Infrastructure

Provide speakers, conduit, and wiring for a stand alone sound system within the reception area. Wiring and conduits shall be run back to the reception desk to be connected (by others) to a sound system provided by others. Provide 10' of slack for all wiring.

3.7.11. Audio/Visual System

Provide a dual 8-pin modular jack outlet at the front of each conference room and an empty 1" conduit (with pull wire) above the ceiling from each GFGI ceiling mounted projector location to a wall mounted outlet box located adjacent to the dual jack outlet.

3.8. FIRE ALARM REQUIREMENTS

- **3.8.1.** All software, software locks, special tools and any other proprietary equipment required to maintain, add devices to or delete devices from the system, or test the Fire Alarm system shall become property of the Government and be furnished to the Contracting Officer's Representative prior to final inspection of the system.
- **3.8.2.** The fire alarm system shall be designed by a registered professional Fire Protection Engineer and installation shall be supervised by a National Institute for Certification of Engineering Technologies (NICET) Level 3 (minimum) technician.

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4.0 APPLICABLE CRITERIA

Unless a specific document version or date is indicated, use criteria from the most current references as of the date of issue of the contract or task order, including any applicable addenda, unless otherwise stated in the task order. In the event of conflict between References and/or Applicable Military Criteria, apply the most stringent requirement, unless otherwise specifically noted in the contract or task order.

4.1. INDUSTRY CRITERIA

Applicable design and construction criteria references are listed in Table 1 below. This list is not intended to include all criteria that may apply or to restrict design and construction to only those references listed. See also Paragraph 3 for additional facility-specific applicable criteria.

Table 1: Industry Criteria

Air Conditioning and Refrigeration Institute (ARI)	
ARI 310/380	Packaged Terminal Air-Conditioners and Heat Pumps
ARI 440	Room Fan-Coil and Unit Ventilator
ANSI/ARI 430-99	Central Station Air Handling Units
ARI 445	Room Air-Induction Units
ARI 880	Air Terminals
Air Movement and Control Association (AMCA)	
AMCA 210	Laboratory Methods of Testing Fans for Rating
American Architectural Manufacturers Association (AAMA)	
AAMA 605	Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
AAMA 607.1	Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum
AAMA 1503	Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections
American Association of State Highway and Transportation Officials (AASHTO)	
	Roadside Design Guide [guardrails, roadside safety devices]
	Standard Specifications for Transportation Materials and Methods of Sampling and Testing [Road Construction Materials]

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	Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals	
	Guide for Design of Pavement Structures, Volumes 1 and 2 [pavement design guide]	
	A Policy of Geometric Design of Highways and Streets	
American Bearing Manufacturers Association (AFBMA)		
AFBMA Std. 9	Load Ratings and Fatigue Life for Ball Bearings	
AFBMA Std. 11	Load Ratings and Fatigue Life for Roller Bearings	
American Boiler Manufacturers Association (ABMA)		
ABMA ISEI	Industry Standards and Engineering Information	
American Concrete Institute		
ACI 302.2R	Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials	
ACI 318	Building Code Requirements for Structural Concrete	
ACI SP-66	ACI Detailing Manual	
ACI 530	Building Code Requirements for Masonry Structures	
ADA Standards for Accessible Design		
See US Access Board	ADA and ABA Accessibility Guidelines for Buildings and Facilities,	
	Chapters 3-10.	
American Institute of Steel Construction (AISC)		
	Manual of Steel Construction – 13 th Edition (or latest version)	
American Iron and Steel Institute		
AISI S100	North American Specification for the Design of Cold-Formed Steel Structural Members	
American National Standards Institute 11 (ANSI)		

ANSI Z21.10.1	Gas Water Heaters Vol. 1, Storage water Heaters with Input Ratings of 75,000 Btu per Hour or less	
ANSI Z124.3	American National Standard for Plastic Lavatories	
ANSI Z124.6	Plastic Sinks	
ANSI Z21.45	Flexible Connectors of Other Than All-Metal Construction for Gas Appliances	
ANSI/IEEE C2-2007	National Electrical Safety Code	
ANSI/AF&PA NDS-2001	National Design Specification for Wood Construction	
American Society of Civil Engineers (ASCE)		
ASCE 7	Minimum Design Loads for Buildings and Other Structures	
ASCE 37	Design and Construction of Sanitary and Storm Sewers, Manuals and Reports on Engineering Practice [sanitary sewer and storm drain design criteria]	
ASCE/SEI 31-03	Seismic Evaluation of Existing Buildings [Existing Building Alteration/Renovation]	
ASCE/SEI 41-06	Seismic Rehabilitation of Existing Buildings [Existing Building Alteration/Renovation]	
American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)		
ASHRAE 90.1	ANSI/ASHRAE/IESNA 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings	
ASHRAE Guideline 0	The Commissioning Process	
ASHRAE Guideline 1.1	The HVAC Commissioning Process	
ASHRAE Handbooks	Fundamentals, HVAC Applications, Systems and Equipment, Refrigeration (Applicable, except as otherwise specified)	
ASHRAE Standard 15	Safety Standard for Refrigeration Systems	
ASHRAE Standard 62.1	Ventilation for Acceptable Indoor Air Quality	
ASHRAE Standard 55	Thermal Environmental Conditions for Human Occupancy (Design portion is applicable)	

American Society of Mechanical Engineers International (ASME)		
ASME BPVC SEC VII	Boiler and Pressure Vessel Code: Section VII Recommended Guidelines for the Care of Power Boilers	
ASME A17.1	Safety Code for Elevators and Escalators	
ASME B 31 (Series)	Piping Codes	
American Water W	Vorks Association (AWWA)	
	Standards [standards for water line materials and construction]	
American Welding	Society	
	Welding Handbook	
	Welding Codes and Specifications (as applicable to application, see International Building Code for example)	
Architectural Woo	dwork Institute (AWI)	
Version 1.2	AWI Quality Standards 7th Edition	
Associated Air Ba	Associated Air Balance Council (AABC)	
AABC MN-1	National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems	
	AABC Associated Air Balance Council Testing and Balance Procedures	
ASTM Internationa	ıl _,	
ASTM C1060-90(1997)	Standard Practice for Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings	
ASTM E 779 (2003)	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	
ASTM E1827-96(2002)	Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door	
Builders Hardware Manufacturers Association (BHMA)		
ANSI/BHMA	American National Standards for Builders Hardware	

Building Industry Consulting Service International	
	Telecommunications Distribution Methods Manual (TDMM)
	Customer-Owned Outside Plant Design Manual (CO-OSP)
Code of Federal Regulations (CFR)	
49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
10 CFR 430	Energy Conservation Program for Consumer Products
Consumer Electronics Association	
CEA 709.1B	Control Network Protocol Specification
CEA 709.3	Free-Topology Twisted-Pair Channel Specification
CEA 852	Tunneling Component Network Protocols Over Internet Protocol Channels
Electronic Industries Association (EIA)	
ANSI/EIA/TIA 568	Structured Cabling Series
ANSI/EIA/TIA 569	Commercial Building Standard for Telecommunications Pathways and Spaces (includes ADDENDA)
ANSI/TIA/EIA-606	Administrative Standard for the Telecommunications Infrastructure of Commercial Buildings
J-STD EIA/TIA 607	Commercial Building Grounding and Bonding Requirements for Telecommunications
Federal Highway Administration (FHWA)	
	Manual on Uniform Traffic Control Devices for Streets and Highways [signage and pavement markings for streets and highways]
FHWA-NHI-01-021	Hydraulic Engineering Circular No. 22, Second Edition, URBAN DRAINAGE DESIGN MANUAL
Illuminating Engineering Society of North America (IESNA)	
IESNA RP-1	Office Lighting

IESNA RP-8	Roadway Lighting	
IESNA Lighting Handbook	Reference and Application	
Institute of Electrical and Electronics Engineers Inc. (IEEE)		
	Standard for Use of the International System of Units (SI): the Modern Metric System	
Standard 1100	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment	
International Code C	International Code Council (ICC)	
IBC	International Building Code	
	Note: All references in the International Building Code to the International Electrical Code shall be considered to be references to NFPA 70.	
	All references in the International Building Code to the International Fuel Gas Code shall be considered to be references to NFPA 54 and NFPA 58.	
	All references in the International Building Code to the International Fire Code and Chapter 9 shall be considered to be references to Unified Facilities Criteria (UFC) 3-600-01.	
IMC	International Mechanical Code –	
	Note: For all references to "HEATING AND COOLING LOAD CALCULATIONS", follow ASHRAE 90.1	
	Note: For all references to "VENTILATION", follow ASHRAE 62.1	
IRC	International Residential Code	
IPC	International Plumbing Code	
IEC	Energy Conservation Code (IEC) –Applicable only to the extent specifically referenced herein. Refer to Paragraph 5, ENERGY CONSERVATION requirements.	
IGC	International Gas Code - not applicable. Follow NFPA 54, National Fuel Gas Code and NFPA 58, Liquified Petroleum Gas Code.	
International Organization for Standardization (ISO)		
ISO 6781:1983	Qualitative detection of thermal irregularities in building envelopes –	
	1	

	infrared method		
LonMark International (LonMark)			
LonMark Interoperability Guidelines	(available at www.lonmark.org), including: Application Layer Guidelines, Layer 1-6 Guidelines, and External Interface File (XIF) Reference Guide		
LonMark Resource Files	(available at www.lonmark.org), including Standard Network Variable Type (SNVT) definitions		
Metal Building Man	nufacturers Association (MBMA)		
	Metal Building Systems Manual		
Midwest Insulation	Midwest Insulation Contractors Association (MICA)		
	National Commercial and Industrial Insulation Standards Manual		
National Association	on of Corrosion Engineers International (NACE)		
NACE RP0169	Control of External Corrosion on Underground or Submerged Metallic Piping Systems		
NACE RP0185	Extruded, Polyolefin Resin Coating Systems with Adhesives for Underground or Submerged Pipe		
NACE RP0285	Corrosion Control of Underground Storage Tank Systems by Cathodic Protection		
NACE RP0286	Electrical Isolation of Cathodically Protected Pipelines		
National Electrical	National Electrical Manufacturers Association (NEMA)		
National Environme	ental Balancing Bureau (NEBB)		
	Procedural Standards Procedural Standards for Testing Adjusting Balancing of Environmental Systems		
National Fire Prote	ction Association (NFPA)		
NFPA 10	Standard for Portable Fire Extinguishers		
NFPA 13	Installation of Sprinkler Systems		
NFPA 13R	Residential Occupancies up to and Including Four Stories in Height Sprinkler Systems		

NFPA 14	Standard for the Installation of Standpipes and Hose Systems
NFPA 20	Installation of Centrifugal Fire Pumps
NFPA 24	Standard for the Installation of Private Fire Service Mains and Their Appurtenances [underground fire protection system design]
NFPA 25	Inspection, Testing And Maintenance Of Water-Based Fire Protection Systems
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Motor Fuel Dispensing Facilities and Repair Garages
NFPA 31	Installation of Oil Burning Equipment
NFPA 54	National Fuel Gas Code
NFPA 58	Liquefied Petroleum Gas Code
NFPA 70	National Electrical Code
NFPA 72	National Fire Alarm Code
NFPA 76	Fire Protection of Telecommunications Facilities
NFPA 80	Standard for Fire Doors and Fire Windows
NFPA 90a	Installation of Air Conditioning and Ventilating Systems
NFPA 96	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
NFPA 101	Life Safety Code
NFPA 780	Standard for the Installation of Lightning Protection Systems
National Roofing Contractor's Association (NRCA)	
	Roofing and Waterproofing Manual
National Sanitation Foundation, International	
NSF/ANSI Std. 2, 3, 4, 5, 6, 7, 8, 12, 13, 18, 20, 21, 25, 29, 35, 36, 37, 51, 52, 59,	Food Equipment Standards

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ANSI/UL Std. 73, 197, 471, 621, 763	Food Equipment Standards	
CSA Std. C22.2 No. 109, 120, 195	Food Equipment Standards	
Occupational Safety and Health Administration (OSHA)		
Title 29, Part 1926	OSHA Construction Industry Standards, Title 29, Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction	
Plumbing and Drainage Institute (PDI)		
PDI G 101	Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data	
PDI WH201	Water Hammer Arrestors	
Precast Concrete Institute		
PCI Design Handbook	Precast and Prestressed Concrete	
Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)		
SMACNA HVAC Duct Construction Standards	HVAC Duct Construction Standards - Metal and Flexible	
SMACNA Architectural Manual	Architectural Sheet Metal Manual	
SMACNA HVAC TAB	HVAC Systems - Testing, Adjusting and Balancing	
State/Local Regulation	ons	
	State Department of Transportation Standard Specifications for Highway and Bridge Construction	
	Sedimentation and Erosion Control Design Requirements	
	Environmental Control Requirements	
	Storm Water Management Requirements	
Steel Door Institute (SDI)		

Standard Steel Doors and Frames	
Steel Deck Institute	
SDI Diaphragm Design Manual	
Steel Joist Institute	
Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders	
Underwriters Laboratories (UL)	
Installation Requirements for Lightning Protection Systems	
Standard for Safety for Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas	
UNITED STATES ACCESS BOARD: U.S. ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD	
ABA Accessibility Standard for DoD Facilities Derived from the ADA and ABA Accessibility Guidelines: Specifically includes: ABA Chapters 1 and 2 and Chapters 3 through 10. Use this reference in lieu of IBC Chapter 11. Excluded are: (a) Facilities, or portions of facilities, on a military installation that are designed and constructed for use exclusively by able-bodied military personnel (See Paragraph 3 for any reference to this exclusion). (b) Reserve and National Guard facilities, or portions of such facilities, owned by or under the control of the Department of Defense, that are designed and constructed for use exclusively by able-bodied military personnel. (See paragraph 3 for any reference to this exclusion).	
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES	
FDA National Food Code	
U.S. GREEN BUILDING COUNCIL (USGBC)	
Green Building Rating System for New Construction & Major Renovations	
Application Guide for Multiple Buildings and On-Campus Building Projects	

4.2. MILITARY CRITERIA

The project shall conform to the following criteria. Certain design impacts and features due to these criteria are noted for the benefit of the offeror. However, all requirements of the referenced criteria will be applicable, whether noted or not, unless otherwise specified herein.

- 4.2.1. Energy Policy Act of 2005 (Public Law 109-58) (applies only to the extent specifically implemented in the contract, which may or may not directly cite or reference EPACT)
- 4.2.2. Executive Order 12770: Metric Usage In Federal Government
- (a) Metric design and construction is required except when it increases construction cost. Offeror to determine most cost efficient system of measurement to be used for the project.
- 4.2.3. TB MED 530: Occupational and Environmental Health Food Sanitation
- 4.2.4. Unified Facilities Criteria (UFC) 3-410-01FA: Heating, Ventilating, and Air Conditioning applicable only to the extent specified in paragraph 5, herein.
- 4.2.5. Deleted.
- 4.2.6. UFC 3-600-01 Design: Fire Protection Engineering for Facilities. Use the latest edition of the IBC in coordination with this UFC. Use Chapters 3, 6, 7, 33 and UFC 3-600-01. If any conflict occurs between these Chapters and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence. Use UFC 3-600-01 in lieu of IBC Chapters 4, 8,9,10.
- 4.2.7. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
- 4.2.8. UFC 4-023-03 Design of Buildings to Resist Progressive Collapse (Use most recent version, regardless of references thereto in other publications)
- (a) Note the option to use tie force method or alternate path design for Occupancy Category II.
- 4.2.9. UFC 4-021-01 Design and O&M: Mass Notification Systems
- 4.2.10. Technical Criteria for Installation Information Infrastructure Architecture (I3A)
- (a) Email: <u>DetrickISECI3Aguide@conus.army.mil</u>
- 4.2.11. <u>U.S. Army Information Systems Engineering Command (USAISEC)</u> TG for the Integration of SECRET Internet Protocol (IP) Router Network (SIPRNET). See Paragraph 3 for applicability to specific facility type. May not apply to every facility. This is mandatory criteria for those facilities with SIPRNET.

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5.0 GENERAL TECHNICAL REQUIREMENTS

This paragraph contains technical requirements with general applicability to Army facilities. See also Paragraph 3 for facility type-specific operational, functional and technical requirements. Residential or similar grade finishes and materials are not acceptable for inclusion in these buildings, unless otherwise specifically allowed.

5.1. SITE PLANNING AND DESIGN

- 5.1.1. STANDARDS AND CODES: The site planning and design shall conform to APPLICABLE CRITERIA and to paragraph 6, PROJECT SPECIFIC REQUIREMENTS.
- 5.1.2. SITE PLANNING OBJECTIVES: Group buildings in configurations that create a sense of community and promote pedestrian use. See paragraph 3 for additional site planning requirements relating to building functions.
- 5.1.2.1. Provide enclosures and or visual screening devices for Outdoor Utility such as dumpsters, emergency generators, transformers, heating, ventilation, and air conditioning units from streetscape and courtyard views to limit visual impact. Enclosures shall be compatible with the building they serve and accessible by vehicle. The location of dumpsters can have a significant visual impact and should be addressed as part of an overall building design and incorporated in site planning.
- 5.1.2.2. Where included in the project, dumpster pads shall be concrete (minimum of 8 inches thick on 4 inch base course, unless site conditions dictate more conservative requirements) and directly accessible by way of a paved service drive or parking lot with adequate overhead clearance for collection vehicles. Provide space at dumpster areas for recycling receptacles. Coordinate with Installation on recycling receptacle types, sizes and access requirements and provide space at dumpster areas to accommodate them.
- 5.1.2.3. Vehicular Circulation. Apply design vehicle templates provided by the American Association of State Highway and Transportation Officials (AASHTO) to the site design. The passenger car class includes passenger cars and light trucks, such as vans and pick-ups. The passenger car template is equivalent to the non-organizational privately owned vehicle (POV). The truck class template includes single-unit trucks, recreation vehicles, buses, truck tractor-semi-trailer combinations, and trucks or truck tractors with semi-trailers in combination with full trailers. Provide vehicle clearances required to meet traffic safety for emergency vehicles, service vehicles, and moving vans. Provide required traffic control signage Site entrances and site drive aisles shall maximize spacing between drives, incorporate right-angle turns, and limit points of conflict between traffic. Design Services Drives to restrict access to unauthorized vehicles by removable bollards, gates, or other barriers to meet Anti-Terrorism/Force Protection (ATFP) requirements. Orient service drives to building entrances other than the primary pedestrian entry at the front of the building.
- 5.1.2.4. Provide Emergency Vehicle Access around the facility and shall be in accordance with AT/FP requirements. Maintain a 33-foot clear zone buffer for emergency vehicles, designed to prevent other vehicles from entering the AT/FP standoff to the building.
- 5.1.2.5. Clear and grub all trees and vegetation necessary for construction; but, save as many trees as possible. Protect trees to be saved during the construction process from equipment.
- 5.1.2.6. Stormwater Management. Employ design and construction strategies (Best Management Practices) that reduce stormwater runoff, reduce discharges of polluted water offsite and maintain or restore predevelopment hydrology with respect to temperature, rate, volume and duration of flow to the maximum extent practicable. See paragraph 6, PROJECT SPECIFIC requirements for additional information.
- 5.1.3. EXTERIOR SIGNAGE: Provide exterior signage in accordance with Appendix H, Exterior Signage. Provide exterior NO SMOKING signage that conveys building and grounds smoking policy.
- 5.1.4. EXISTING UTILITIES: Base utilities maps and capacities for this site are included as part of this RFP. See paragraph 6 for more detailed information.

5.2. SITE ENGINEERING

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- 5.2.1. STANDARDS AND CODES: The site engineering shall conform to APPLICABLE CRITERIA.
- 5.2.2. SOILS:
- 5.2.2.1. A report has been prepared to characterize the subsurface conditions at the project site and is **appended to these specifications**. The report provides a general overview of the soil and geologic conditions with detailed descriptions at discrete boring locations. The Contractor's team shall include a licensed geotechnical engineer to interpret the report and develop earthwork and foundation recommendations and design parameters in which to base the contractor's design. If any additional subsurface investigation or laboratory analysis is required to better characterize the site or develop the final design, the Contractor shall perform it under the direction of a licensed geotechnical engineer. There will be no separate payment for the cost of additional tests. If differences between the Contractor's additional subsurface investigation and the government provided soils report or the reasonably expected conditions require material revisions in the design, an equitable adjustment may be made, in accordance with the provisions of the Differing Site Conditions clause. The basis for the adjustment would be the design and construction appropriate for the conditions described in the Government furnished report or the reasonably expected conditions, in comparison with any changes required by material differences in the actual conditions encountered, in accordance with the terms of contract clause Differing Site Conditions.
- 5.2.2.2. The contractor's licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal, as described in Section 01 33 16, *Design After Award*.
- 5.2.3. VEHICLE PAVEMENTS: (as applicable to the project)
- 5.2.3.1. Design procedures and materials shall conform to one of the following: 1) the USACE Pavement Transportation Computer Assisted Structural Engineering (PCASE) program, 2) American Association of State Highway and Transportation Officials (AASHTO) or, 3) the applicable state Department of Transportation standards in which the project is located. See paragraph 5.2.2.2 and Section 01 33 16 for required information for the Contractor's geotechnical evaluation report. The minimum flexible pavement section shall consist of 2 inches of asphalt and 6 inches of base or as required by the pavement design, whichever is greater, unless specifically identified by the Government to be a gravel road. Design roads and parking areas for a life expectance of 25 years with normal maintenance. Parking area for tactical vehicles (as applicable to the project) shall be Portland Cement Concrete (PCC) rigid pavement design. For concrete pavements, submit joint layout plan for review and concurrence. Design pavements for military tracked vehicles (as applicable to the project) IAW USACE PCASE. Traffic estimates for each roadway area will be as shown on the drawings or listed in Section 01 10 00 Paragraph 6.4.4. Pavement markings and traffic signage shall comply with the Installation requirements and with the Manual on Uniform Traffic Control Devices.
- 5.2.3.2. Parking Requirements.
- (a) All handicap POV parking lots (where applicable in the facility specific requirements) shall meet the ADA and ABA Accessibility Guidelines for accessible parking spaces.
- (b) Design POV parking spaces for the type of vehicles anticipated, but shall be a minimum of 9 ft by 18 ft for POVs, except for two wheel vehicles.
- 5.2.3.3. Sidewalks. Design the network of walks throughout the complex (where applicable) to facilitate pedestrian traffic among facilities, and minimize the need to use vehicles. Incorporate sidewalks to enhance the appearance of the site development, while creating a sense of entry at the primary patron entrances to the buildings. Minimum sidewalk requirements are in Paragraph 3, where applicable and/or paragraph 6 and/or site plans, where applicable..
- 5.2.4. CATHODIC PROTECTION: Provide cathodic protection systems for all underground metallic systems and metallic fittings/portions of non-metallic, underground systems, both inside and outside the building 5 foot line that are subject to corrosion. Coordinate final solutions with the installation to insure an approach that is consistent with installation cathodic protection programs.
- 5.2.5. UTILITIES: See paragraph 6.4.6 for specific information on ownership of utilities and utility requirements. Meter all utilities (gas, water, and electric, as applicable) to each facility. For Government owned utilities, install meters that are wireless data transmission capable as well as have a continuous manual reading option. All meters will be capable of at least hourly data logging and transmission and provide consumption data for gas, water, and

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electricity. Gas and electric meters will also provide demand readings based on consumption over a maximum of any 15 minute period. Configure all meters to transmit at least daily even if no receiver for the data is currently available at the time of project acceptance. For privatized utilities, coordinate with the privatization utility(ies) for the proper meter base and meter installation.

- 5.2.6. PERMITS: The CONTRACTOR shall be responsible for obtaining all permits (local, state and federal) required for design and construction of all site features and utilities.
- 5.2.7. IRRIGATION. Landscape irrigation systems, if provided, shall comply with the following:
- 5.2.7.1. Irrigation Potable Water Use Reduction. Reduce irrigation potable water use by 100 percent using LEED credit WE1.1 baseline (no potable water used for irrigation), except where precluded by other project requirements.
- 5.2.8. EPA WaterSense Products and Contractors. Except where precluded by other project requirements, use EPA WaterSense labeled products and irrigation contractors that are certified through a WaterSense labeled program where available.
- 5.3. ARCHITECTURE AND INTERIOR DESIGN:

This element will be evaluated per APPLICABLE CRITERIA under the quality focus.

- 5.3.1. STANDARDS AND CODES: The architecture and interior design shall conform to APPLICABLE CRITERIA.
- 5.3.2. GENERAL: Overall architectural goal is to provide a functional, quality, visually appealing facility that is a source of pride for the installation and delivered within the available budget and schedule.
- 5.3.3. COMPUTATION OF AREAS: See APPENDIX Q for how to compute gross and net areas of the facility(ies).
- 5.3.4. BUILDING EXTERIOR: Design buildings to enhance or compliment the visual environment of the Installation. Where appropriate, reflect a human scale to the facility. Building entrance should be architecturally defined and easily seen. When practical, exterior materials, roof forms, and detailing shall be compatible with the surrounding development and adjacent buildings on the Installation and follow locally established architectural themes. Use durable materials that are easy to maintain. Exterior colors shall conform to the Installation requirements. See paragraph 6.
- 5.3.4.1. Building Numbers: Permanently attach exterior signage on two faces of each building indicating the assigned building number or address. Building number signage details and locations shall conform to Appendix H, Exterior Signage.

5.3.5. BUILDING INTERIOR

- 5.3.5.1. Space Configuration: Arrange spaces in an efficient and functional manner in accordance with area adjacency matrices.
- 5.3.5.2. Surfaces: Appearance retention is the top priority for building and furniture related finishes. Provide low maintenance, easily cleaned room finishes that are commercially standard for the facility occupancy specified, unless noted otherwise.
- 5.3.5.3. Color: The color, texture and pattern selections for the finishes of the building shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Coordinate the building colors and finishes for a cohesive design. Select colors appropriate for the building type. Use color, texture and pattern to path or way find through the building. Trendy colors that will become dated shall be limited to non-permanent finishes such as carpet and paint. Select finisheswith regards to aesthetics, maintenance, durability, life safety and image. Limit the number of similar colors for each material. Use medium range colors for ceramic and porcelain tile groutto help hide soiling. Plastic laminate and solid surface materials shall have patterns that are mottled, flecked or speckled. Coordinate finish colors of fire extinguisher cabinets, receptacle bodies and plates, fire alarms / warning lights, emergency lighting, and other miscellaneous items with the building interior. Match color of equipment items on ceilings (speakers, smoke detectors, grills, etc.) the ceiling color.

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- 5.3.5.4. Circulation: Circulation schemes must support easy way finding within the building.
- 5.3.5.5. Signage: Provide interior signage for overall way finding and life safety requirements. A comprehensive interior plan shall be from one manufacturer. Include the following sign types: (1) Lobby Directory, (2) Directional Signs; (3) Room Identification Signs; (4) Building Service Signs; (5) Regulatory Signs; (6) Official and Unofficial Signs (7) Visual Communication Boards (8) NO SMOKING signage that conveys building smoking policy. Use of emblems or logos may also be incorporated into the signage plan.
- 5.3.5.6. Window Treatment: Provide interior window treatments with adjustable control in all exterior window locations for control of day light coming in windows or privacy at night. Maintain uniformity of treatment color and material to the maximum extent possible within a building.

5.3.6. COMPREHENSIVE INTERIOR DESIGN

- 5.3.6.1. Comprehensive Interior Design includes the integration of a Structural Interior Design (SID) and a Furniture, Fixtures and Equipment (FF&E) design and package. SID requires the design, selection and coordination of interior finish materials that are integral to or attached to the building structure. Completion of a SID involves the selection and specification of applied finishes for the building's interior features including, but not limited to, walls, floors, ceilings, trims, doors, windows, window treatments, built-in furnishings and installed equipment, lighting, and signage. The SID package includes finish schedules, finish samples and any supporting interior elevations, details or plans necessary to communicate the building finish design and build out. The SID also provides basic space planning for the anticipated FF&E requirements in conjunction with the functional layout of the building and design issues such as life safety, privacy, acoustics, lighting, ventilation, and accessibility. See Section 01 33 16 for SID design procedures.
- 5.3.6.2. The FF&E design and package includes the design, selection, color coordination and of the required furnishing items necessary to meet the functional, operational, sustainability, and aesthetic needs of the facility coordinated with the interior finish materials in the SID. The FF&E package includes the specification, procurement documentation, placement plans, ordering and finish information on all freestanding furnishings and accessories, and a cost estimate. Coordinate the selection of furniture style, function and configuration with the defined requirements. Examples of FF&E items include, but are not limited to workstations, seating, files, tables, beds, wardrobes, draperies and accessories as well as marker boards, tack boards, and presentation screens. Criteria for furniture selection include function and ergonomics, maintenance, durability, sustainability, comfort and cost. See Section 01 33 16 for FFE design procedures.

5.4. STRUCTURAL DESIGN

- 5.4.1. STANDARDS AND CODES: The structural design shall conform to APPLICABLE CRITERIA.
- GENERAL: The structural system must be compatible with the intended functions and components that allows for future flexibility and reconfigurations of the interior space. Do not locate columns, for instance, in rooms requiring visibility, circulation or open space, including, but not limited to entries, hallways, common areas, classrooms, etc. Select an economical structural system based upon facility size, projected load requirements and local availability of materials and labor. Base the structural design on accurate, site specific geotechnical information and anticipated loads for the building types and geographical location. Consider climate conditions, high humidity, industrial atmosphere, saltwater exposure, or other adverse conditions when selecting the type of cement and admixtures used in concrete, the concrete cover on reinforcing steel, the coatings on structural members, expansion joints, the level of corrosion protection, and the structural systems. Analyze, design and detail each building as a complete structural system. Design structural elements to preclude damage to finishes. partitions and other frangible, non-structural elements to prevent impaired operability of moveable components; and to prevent cladding leakage and roof ponding. Limit deflections of structural members to the allowable of the applicable material standard, e.g., ACI, AISC, Brick Industry Association, etc. When modular units or other prefabricated construction is used or combined with stick-built construction, fully coordinate and integrate the overall structural design between the two different or interfacing construction types. If the state that the project is located in requires separate, specific licensing for structural engineers (for instance, such as in Florida, California and others), then the structural engineer designer of record must be registered in that state.
- 5.4.3. LOADS: See paragraph 3 for facility specific (if applicable) and paragraph 6 for site and project specific structural loading criteria. Unless otherwise specified in paragraph 6, use Exposure Category C for wind. If not

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specified, use Category C unless the Designer of Record can satisfactorily justify another Exposure Category in its design analysis based on the facility Master Plan. Submit such exceptions for approval as early as possible and prior to the Interim Design Submittal in Section "Design After Award". Design the ancillary building items, e.g. doors, window jambs and connections, overhead architectural features, systems and equipment bracing, ducting, piping, etc. for gravity, seismic, lateral loads and for the requirements of UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings. Ensure and document that the design of glazed items includes, but is not limited to, the following items under the design loads prescribed in UFC 4-010-01:

- (a) Supporting members of glazed elements, e.g. window jamb, sill, header
- (b) Connections of glazed element to supporting members, e.g. window to header
- (c) Connections of supporting members to each other, e.g. header to jamb
- (d) Connections of supporting members to structural system, e.g. jamb to foundation.
- 5.4.4. TERMITE TREATMENT: (Except Alaska) Provide termite prevention treatment in accordance with Installation and local building code requirements, using licensed chemicals and licensed applicator firm.
- 5.5. THERMAL PERFORMANCE
- 5.5.1. STANDARDS AND CODES: Building construction and thermal insulation for mechanical systems shall conform to APPLICABLE CRITERIA.
- 5.5.2. BUILDING ENVELOPE SEALING PERFORMANCE REQUIREMENT. Design and construct the building envelope for office buildings, office portions of mixed office and open space (e.g., company operations facilities), dining, barracks and instructional/training facilities with a continuous air barrier to control air leakage into, or out of, the conditioned space. Clearly identify all air barrier components of each envelope assembly on construction documents and detail the joints, interconnections and penetrations of the air barrier components. Clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness on the drawings. Pending the publication of the 2010 version of ASHRAE 90.1, the use of painted interior walls is not an acceptable air barrier method.
- 5.5.2.1. Trace a continuous plane of air-tightness throughout the building envelope and make flexible and seal all moving joints.
- 5.5.2.2. The air barrier material(s) must have an air permeance not to exceed 0.004 cfm / sf at 0.3" wg (0.02 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 2178
- 5.5.2.3. Join and seal the air barrier material of each assembly in a flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of these assemblies and components.
- 5.5.2.4. Support the air barrier so as to withstand the maximum positive and negative air pressure to be placed on the building without displacement, or damage, and transfer the load to the structure.
- 5.5.2.5. Seal all penetrations of the air barrier. If any unavoidable penetrations of the air barrier by electrical boxes, plumbing fixture boxes, and other assemblies are not airtight, make them airtight by sealing the assembly and the interface between the assembly and the air barrier or by extending the air barrier over the assembly.
- 5.5.2.6. The air barrier must be durable to last the anticipated service life of the assembly.
- 5.5.2.7. Do not install lighting fixtures with ventilation holes through the air barrier
- 5.5.2.8. Provide a motorized damper in the closed position and connected to the fire alarm system to open on call and fail in the open position for any fixed open louvers such as at elevator shafts.
- 5.5.2.9. Damper and control to close all ventilation or make-up air intakes and exhausts, atrium smoke exhausts and intakes, etc when leakage can occur during inactive periods.
- 5.5.2.10. Compartmentalize garages under buildings by providing air-tight vestibules at building access points.

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- 5.5.2.11. Compartmentalize spaces under negative pressure such as boiler rooms and provide make-up air for combustion.
- 5.5.2.12. Performance Criteria and Substantiation: Submit the qualifications and experience of the testing entity for approval. Demonstrate performance of the continuous air barrier for the opaque building envelope by the following tests:
- (a) Test the completed building and demonstrate that the air leakage rate of the building envelope does not exceed 0.25cfm/ft2 at a pressure differential of 0.3" w.g.(75 Pa) in accordance with ASTM's E 779 (2003) or E-1827-96 (2002). Accomplish tests using either pressurization or depressurization or both. Divide the volume of air leakage in cfm @ 0.3" w.g. (L/s @ 75 Pa) by the area of the pressure boundary of the building, including roof or ceiling, walls and floor to produce the air leakage rate in cfm/ft2 @ 0.3" w.g. (L/s.m2 @ 75 Pa). Do not test the building until verifying that the continuous air barrier is in place and installed without failures in accordance with installation instructions so that repairs to the continuous air barrier, if needed to comply with the required air leakage rate, can be done in a timely manner.
- (b) Test the completed building using Infrared Thermography testing. Use infrared cameras with a resolution of 0.1deg C or better. Perform testing on the building envelope in accordance with ISO 6781:1983 and ASTM C1060-90(1997). Determine air leakage pathways using ASTM E 1186-03 Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems, and perform corrective work as necessary to achieve the whole building air leakage rate specified in (a) above.
- (c) Notify the Government at least three working days prior to the tests to provide the Government the opportunity to witness the tests. Provide the Government written test results confirming the results of all tests.
- 5.6. PLUMBING
- 5.6.1. STANDARDS AND CODES: The plumbing system shall conform to APPLICABLE CRITERIA.
- 5.6.2. PRECAUTIONS FOR EXPANSIVE SOILS: Where expansive soils are present, include design features for underslab piping systems and underground piping serving chillers, cooling towers, etc, to control forces resulting from soil heave. Some possible solutions include, but are not necessarily limited to, features such as flexible expansion joints, slip joints, horizontal offsets with ball joints, or multiple bell and spigot gasketed fittings. For structurally supported slabs, suspend piping from the structure with adequate space provided below the pipe for the anticipated soil movement.
- 5.6.3. HOT WATER SYSTEMS: For Hot Water heating and supply, provide a minimum temp of 140 Deg F in the storage tank and a maximum of 110 Deg F at the fixture, unless specific appliances or equipment specifically require higher temperature water supply.
- 5.6.4. SIZING HOT WATER SYSTEMS: Unless otherwise specified or directed in paragraph 3, design in accordance with ASHRAE Handbook Series (appropriate Chapters), ASHRAE Standard 90.1, and the energy conservation requirements of the contract. Size and place equipment so that it is easily accessible and removable for repair or replacement.
- 5.6.5. JANITOR CLOSETS: In janitor spaces/room/closets, provide at minimum, a service sink with heavy duty shelf and wall hung mop and broom rack(s).
- 5.6.6. FLOOR DRAINS: As a minimum, provide floor drains in mechanical rooms and areas, janitor spaces/rooms/closets and any other area that requires drainage from fixtures or equipment, drain downs, condensate, as necessary.
- 5.6.7. URINALS: Urinals shall be vitreous china, wall-mounted, wall outlet, non-water using, with integral drain line connection, and with sealed replaceable cartridge or integral liquid seal trap. Either type shall use a biodegradable liquid to provide the seal and maintain a sanitary and odor-free environment. Install, test and maintain in accordance with manufacturer's recommendations. Slope the sanitary sewer branch line for non-water use urinals a minimum of 1/4 inch per foot. Do not use copper tube or pipe for drain lines that connect to the urinal. Manufacturer shall provide an operating manual and on-site training to installation operations personnel for the proper care and maintenance of the urinal. For complexes, non-water using urinals are not required for barracks type spaces.

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5.6.8. BUILDING WATER USE REDUCTION. Reduce building potable water use in each building 30 percent using IPC fixture performance requirements baseline.

- 5.6.9. Do not use engineered vent or Sovent® type drainage systems.
- 5.6.10. Where the seasonal design temperature of the cold water entering a building is below the seasonal design dew point of the indoor ambient air, and where condensate drip will cause damage or create a hazard, insulate plumbing piping with a vapor barrier type of insulation to prevent condensation. Do not locate water or drainage piping over electrical wiring or equipment unless adequate protection against water (including condensation) damage is provided. Insulation alone is not adequate protection against condensation. Follow ASHRAE Fundamentals Chapter 23, Insulation for Mechanical Systems, IMC paragraph 1107 and International Energy Conservation Code for pipe insulation requirements.
- 5.7. ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS
- 5.7.1. STANDARDS AND CODES: The electrical systems for all facilities shall conform to APPLICABLE CRITERIA.
- 5.7.2. MATERIALS AND EQUIPMENT: Materials, equipment and devices shall, as a minimum, meet the requirements of Underwriters Laboratories (UL) where UL standards are established for those items. Wiring for branch circuits shall be copper. Motors larger than one-half horsepower shall be three phase. All electrical systems shall be pre-wired and fully operational unless otherwise indicated. Wall mounted electrical devices (power receptacles, communication outlets and CATV outlets) shall have matching colors, mounting heights and faceplates.
- 5.7.3. POWER SERVICE: Primary service from the base electrical distribution system to the pad-mounted transformer and secondary service from the transformer to the building service electrical equipment room shall be underground. See paragraph 6 for additional site electrical requirements.
- 5.7.3.1. Spare Capacity: Provide 10% space for future circuit breakers in all panelboards serving residential areas of buildings and 15% spaces in all other panelboards.
- 5.7.4. TELECOMMUNICATION SERVICE: Connect the project's facilities to the Installation telecommunications (voice and data) system through the outside plant (OSP) telecommunications underground infrastructure cabling system per the I3A Criteria. Connect to the OSP cabling system from each facility main cross connect located in the telecommunications room.
- 5.7.5. LIGHTING: Comply with the recommendations of the Illumination Engineering Society of North America (IESNA), the National Energy Policy Act and Energy Star requirements for lighting products..
- 5.7.5.1. Interior Lighting:
- (a) Reflective Surfaces: Coordinate interior architectural space surfaces and colors with the lighting systems to provide the most energy-efficient workable combinations.
- (b) High Efficiency Fluorescent Lighting: Utilize NEMA premium electronic ballasts and energy efficient fluorescent lamps with a Correlated Color Temperature (CCT) of 4100K. Linear fluorescent and compact fluorescent fixtures shall have a Color Rendering Index of (CRI) of 87 or higher. Fluorescent lamps shall be the low mercury type qualifying as non-hazardous waste upon disposal. Do not use surface mounted fixtures on acoustical tile ceilings. Provide an un-switched fixture with emergency ballast shall be provided at each entrance to the building.
- (c) Solid State Lighting: Fixtures shall provide lighting with a minimum Correlated Color Temperature (CCT) of 4100K and shall have a Color Rendering Index of (CRI) of 75 or higher. Verify performance of the light producing solid state components by a test report in compliance with the requirements of IESNA LM 80. Verify performance of the solid state light fixtures by a test report in compliance with the requirements of IESNA LM 79. Provide lab results by a NVLAP certified laboratory. The light producing solid state components and drivers shall have a life expectancy of 50,000 operating hours while maintaining at least 70% of original illumination level. Provide a complete five year warranty for fixtures.

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- (d) Metal Halide Lighting (where applicable): Metal Halide lamp fixtures in the range of 150-500 Watts shall be pulse start type and have a minimum efficiency rating of 88%.
- (e) Lighting Controls: ANSI/ASHRAE/IESNA 90.1 has specific lighting controls requirements. Provide a high level of lighting system control by individual occupants or by specific groups in multi-occupant spaces (classrooms, conference rooms) to promote the productivity, comfort and well being of the building occupants. In office spaces, the preferred lighting should be a 30 FC ambient lighting level with occupancy sensor controlled task lighting in the work spaces to provide a composite lighting level of 50 FC on the working surfaces. Consider incorporating daylighting techniques for the benefit of reducing lighting energy requirements while improving the quality of the indoor spaces. If daylight strategies are used, additional coordination is required with the architect and mechanical engineer. Additionally, incorporate electric lighting controls to take advantage of the potential energy savings.
- (f) Exterior Lighting: See paragraph 6.9 for site specific information, if any, on exterior lighting systems. Minimize light pollution and light trespass by not over lighting and use cut-off type exterior luminaries.
- 5.7.6. TELECOMMUNICATION SYSTEM: Building telecommunications cabling systems (BCS) and OSP telecommunications cabling system shall conform to APPLICABLE CRITERIA, including but not limited to I3A Technical Criteria. An acceptable BCS encompasses, but is not limited to, copper and fiber optic (FO) entrance cable, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, workstation outlets, racks, cable management, patch panels, cable tray, cable ladder, conduits, grounding, and labeling. Items included under OSP infrastructure encompass, but are not limited to, manhole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, cable vaults, and copper and FO entrance cable.
- 5.7.6.1. Design, install, label and test all telecommunications systems in accordance with the I3A Criteria and ANSI/TIA/EIA 568, 569, and 606 standards. A Building Industry Consulting Services International (BICSI) Registered Communications Distribution Designer (RCDD) with at least 2 yrs related experience shall develop and stamp telecommunications design, and prepare the test plan. See paragraph 5.8.2.5 for design of environmental systems for Telecommunications Rooms.
- 5.7.6.2. The installers assigned to the installation of the telecommunications system or any of its components shall be regularly and professionally engaged in the business of the application, installation and testing of the specified telecommunications systems and equipment. Key personnel; i.e., supervisors and lead installers assigned to the installation of this system or any of its components shall be BICSI Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification for each of the key personnel. In lieu of BICSI certification, supervisors and installers shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products.
- 5.7.6.3. Perform a comprehensive end to end test of all circuits to include all copper and fiber optic cables upon completion of the BCS and prior to acceptance of the facility. Provide adequate advanced notification to the COR to allow COR and Installation personnel attendance The BCS circuits include but are not limited to all copper and fiber optic(FO) entrance cables, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, and workstation outlets. Test in accordance with ANSI/EIA/TIA 568 standards. Use test instrumentation that meets or exceeds the standard. Submit the official test report to include test procedures, parameters tested, values, discrepancies and corrective actions in electronic format. Test and accomplish all necessary corrective actions to ensure that the government receives a fully operational, standards based, code compliant telecommunications system.
- 5.7.7. LIGHTNING PROTECTION SYSTEM: Provide a lightning protection system where recommended by the Lightning Risk Assessment of NFPA 780, Annex L.
- 5.8. HEATING, VENTILATING, AND AIR CONDITIONING
- 5.8.1. STANDARDS AND CODES: The HVAC system shall conform to APPLICABLE CRITERIA.
- 5.8.2. DESIGN CONDITIONS.
- 5.8.2.1. Outdoor and indoor design conditions shall be in accordance with UFC 3-410-01FA. Outdoor air and exhaust ventilation requirements for indoor air quality shall be in accordance with ASHRAE 62.1. All Buildings with

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minimum LEED Silver requirement (or better) will earn LEED Credit EQ 7.1, Thermal Comfort-Design., except where precluded by other project requirements. Where the contract specifies indoor design temperature, airflow, humidity conditions, etc., use those parameters.

- 5.8.2.2. Design systems in geographical areas that meet the definition for high humidity in UFC 3-410-01FA in accordance with the special criteria for humid areas therein.
- 5.8.2.3. Cooling equipment may be oversized by up to 15 percent to account for recovery from night setforward. Heating equipment may be oversized by up to 30 percent to account for recovery from night setback. Design single zone systems and multi-zone systems to maintain an indoor design condition of 50% relative humidity for cooling only. For heating only where the indoor relative humidity is expected to fall below 20% for extended periods, add humidification to increase the indoor relative humidity to 30%. Provide ventilation air from a separate dedicated air handling unit (DOAU) for facilities using multiple single zone fan-coil type HVAC systems. Do not condition outside air through fan coil units. Avoid the use of direct expansion cooling coils in air handling units with constant running fans that handle outside air.
- 5.8.2.4. Locate all equipment so that service, adjustment and replacement of controls or internal components are readily accessible for easy maintenance.
- 5.8.2.5. Environmental Requirements for Telecommunications Rooms, (including SIPRNET ROOMS, where applicable for specific facility type). Comply with ANSI/EIA/TIA 569 and the I3A.
- 5.8.2.6. Fire dampers: dynamic type with a dynamic rating suitable for the maximum air velocity and pressure differential to which the damper is subjected. Test each fire damper with the air handling and distribution system running.
- 5.8.3. BUILDING AUTOMATION SYSTEM. Provide a Building Automation System consisting of a building control network, and integrate the building control network into the UMCS as specified.

The building control network shall be a single complete non-proprietary Direct Digital Control (DDC) system for control of the heating, ventilating and air conditioning (HVAC) systems as specified herein. The building control network shall be an Open implementation of LonWorks® technology using ANSI/EIA 709.1B as the only communications protocol and use only LonMark Standard Network Variable Types (SNVTs), as defined in the LonMark® Resource Files, for communication between DDC Hardware devices to allow multi-vendor interoperability.

- 5.8.3.1. The building automation system shall be open in that it is designed and installed such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without further dependence on the original Contractor. This includes, but is not limited to the following:
- (a) Install hardware such that individual control equipment can be replaced by similar control equipment from other equipment manufacturers with no loss of system functionality.
- (b) Necessary documentation (including rights to documentation and data), configuration information, configuration tools, programs, drivers, and other software shall be licensed to and otherwise remain with the Government such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without subsequent or future dependence on the Contractor.

5.8.3.2. All DDC Hardware shall:

- (a) Be connected to a TP/FT-10 ANSI/EIA 709.3 control network.
- (b) Communicate over the control network via ANSI/EIA 709.1B exclusively.
- (c) Communicate with other DDC hardware using only SNVTs
- (d) Conform to the LonMark® Interoperability Guidelines.
- (e) Be locally powered; link power (over the control network) is not acceptable.
- (f) Be fully configurable via standard or user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (*nci*), or hardware settings on the controller itself to support the application. All settings and parameters used by the application shall be configurable via standard or

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user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (*nci*), or hardware settings on the controller itself

- (g) Provide input and output SNVTs required to support monitoring and control (including but not limited to scheduling, alarming, trending and overrides) of the application. Required SNVTs include but are not limited to: SNVT outputs for all hardware I/O, SNVT outputs for all setpoints and SNVT inputs for override of setpoints.
- (h) To the greatest extent practical, not rely on the control network to perform the application...
- 5.8.3.3. Controllers shall be Application Specific Controllers whenever an ASC suitable for the application exists. When an ASC suitable for the application does not exist use programmable controllers or multiple application specific controllers.
- 5.8.3.4. Application Specific Controllers shall be LonMark Certified whenever a LonMark Certified ASC suitable for the application exists. For example, VAV controllers must be LonMark certified.
- 5.8.3.5. Application Specific Controllers (ASCs) shall be configurable via an LNS plug-in whenever t an ASC with an LNS plug-in suitable for the application exists.
- 5.8.3.6. Each scheduled system shall accept a network variable of type SNVT_occupancy and shall use this network variable to determine the occupancy mode. If the system has not received a value to this network variable for more than 60 minutes it shall default to a configured occupancy schedule.
- 5.8.3.7. Gateways may be used provided that each gateway communicates with and performs protocol translation for control hardware controlling one and only one package unit.
- 5.8.3.8. Not Used
- 5.8.3.9. Perform all necessary actions needed to fully integrate the building control system. These actions include but are not limited to:
- Configure M&C Software functionality including: graphical pages for System Graphic Displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting.
- Install IP routers or ANSI/CEA-852 routers as needed to connect the building control network to the UMCS IP network. Routers shall be capable of configuration via DHCP and use of an ANSI/CEA-852 configuration server but shall not rely on these services for configuration. All communication between the UMCS and building networks shall be via the ANSI/CEA-709.1B protocol over the IP network in accordance with ANSI/CEA-852.
- 5.8.3.10. Provide the following to the Government for review prior to acceptance of the system:
- The latest version of all software and user manuals required to program, configure and operate the system.
- Points Schedule drawing that shows every DDC Hardware device. The Points Schedule shall contain the following information as a minimum:
 - Device address and NodelD.
 - o Input and Output SNVTs including SNVT Name, Type and Description.
 - Hardware I/O, including Type (Al, AO, Bl, BO) and Description.
 - Alarm information including alarm limits and SNVT information.
 - Supervisory control information including SNVTs for trending and overrides.
 - Configuration parameters (for devices without LNS plug-ins) Example Points Schedules are available at https://eko.usace.army.mil/fa/besc/
- Riser diagram of the network showing all network cabling and hardware. Label hardware with ANSI.CEA-709.1 addresses, IP addresses, and network names.
- Control System Schematic diagram and Sequence of Operation for each HVAC system.
- Operation and Maintenance Instructions including procedures for system start-up, operation and shut-down, a routine maintenance checklist, and a qualified service organization list.
- LONWORKS® Network Services (LNS®) database for the completed system.
- Quality Control (QC) checklist (below) completed by the Contractor's Chief Quality Control (QC)
 Representative

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5.8.3.11. Perform a Performance Verification Test (PVT) under Government supervision prior to system acceptance. During the PVT demonstrate that the system performs as specified, including but not limited to demonstrating that the system is Open and correctly performs the Sequences of Operation.

- 5.8.3.12. Provide a 1 year unconditional warranty on the installed system and on all service call work. The warranty shall include labor and material necessary to restore the equipment involved in the initial service call to a fully operable condition.
- 5.8.3.13. Provide training at the project site on the installed building system Upon completion of this training each student, using appropriate documentation, should be able to start the system, operate the system, recover the system after a failure, perform routine maintenance and describe the specific hardware, architecture and operation of the system.

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- 5.8.4. TESTING, ADJUSTING AND BALANCING. Test and balance air and hydronic systems, using a firm certified for testing and balancing by the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), or the Testing Adjusting, and Balancing Bureau (TABB). The prime contractor shall hire the TAB firm directly, not through a subcontractor. Perform TAB in accordance with the requirements of the standard under which the TAB Firm's qualifications are approved, i.e., AABC MN-1, NEBB TABES, or SMACNA HVACTAB unless otherwise specified herein. All recommendations and suggested practices contained in the TAB Standard shall be considered mandatory. Use the provisions of the TAB Standard, including checklists, report forms, etc., as nearly as practicable to satisfy the Contract requirements. Use the TAB Standard for all aspects of TAB, including qualifications for the TAB Firm and Specialist and calibration of TAB instruments. Where the instrument manufacturer calibration recommendations are more stringent than those listed in the TAB Standard, adhere to the manufacturer's recommendations. All quality assurance provisions of the TAB Standard such as performance guarantees shall be part of this contract. For systems or system components not covered in the TAB Standard, the TAB Specialist shall develop TAB procedures. Where new procedures, requirements, etc., applicable to the Contract requirements have been published or adopted by the body responsible for the TAB Standard used (AABC, NEBB, or TABB), the requirements and recommendations contained in these procedures and requirements are mandatory.
- 5.8.5. COMMISSIONING: Commission all HVAC systems and equipment, including controls, and all systems requiring commissioning for LEED Enhanced commissioning, in accordance with ASHRAE Guideline 1.1, ASHRAE Guideline 0 and LEED. Do not use the sampling techniques discussed in ASHRAE Guideline 1.1 and in ASHRAE Guideline 0. Commission 100% of the HVAC controls and equipment. Hire the Commissioning Authority (CA), certified as a CA by AABC, NEBB, or TABB, as described in Guideline 1.1. The CA will be an independent subcontractor and not an employee of the Contractor nor an employee or subcontractor of any other subcontractor on this project, including the design professionals (i.e., the DOR or their firm(s)). The CA will communicate and report directly to the Government in execution of commissioning activities. The Contracting Officer's Representative will act as the Owner's representative in performance of duties spelled out under OWNER in Annex F of ASHRAE Guideline 0. All buildings with Minimum LEED Silver (or better) requirement will earn LEED Credit EA3 Enhanced Commissioning.

5.9. ENERGY CONSERVATION

- 5.9.1. The building including the building envelope, HVAC systems, service water heating, power, and lighting systems shall meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Substantiation requirements are defined in Section 01 33 16, Design After Award.
- 5.9.2. Design all building systems and elements to meet the minimum requirements of ANSI/ASHRAE/IESNA 90.1. Design the buildings, including the building envelope, HVAC systems, service water heating, power, and lighting systems to achieve an energy consumption that is at least 40% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1. Energy calculation methodologies and substantiation requirements are defined in Section 01 33 16, Design After Award.
- 5.9.3. Purchase Energy Star products, except use FEMP designated products where FEMP is applicable to the type product. The term "Energy Star product" means a product that is rated for energy efficiency under an Energy Star program. The term "FEMP designated product" means a product that is designated under the Federal Energy Management Program of the Department of Energy as being among the highest 25 percent of equivalent products

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for energy efficiency. When selecting integral sized electric motors, choose NEMA PREMIUM type motors that conform to NEMA MG 1, minimum Class F insulation system. Motors with efficiencies lower than the NEMA PREMIUM standard may only be used in unique applications that require a high constant torque speed ratio (e.g., inverter duty or vector duty type motors that conform to NEMA MG 1, Part 30 or Part 31).

- 5.9.4. Solar Hot Water Heating. Provide at least 30% of the domestic hot water requirements through solar heating methodologies, unless the results of a Life Cycle Cost Analysis (LCCA) developed utilizing the Building Life Cycle Cost Program (BLCC) which demonstrates that the solar hot water system is not life cycle cost effective in comparison with other hot water heating systems. The type of system will be established during the contract or task order competition and award phase, including submission of an LCCA for government evaluation to justify non-selection of solar hot water heating. The LCCA uses a study period of 25 years and the Appendix K utility cost information. The LCCA shall include life cycle cost comparisons to a baseline system to provide domestic hot water without solar components, analyzing at least two different methodologies for providing solar hot water to compare against the baseline system.
- 5.9.5. Process Water Conservation. When potable water is used to improve a building's energy efficiency, employ lifecycle cost effective water conservation measures, except where precluded by other project requirements.
- 5.9.6. Renewable Energy Features. The Government's goal is to implement on-site renewable energy generation for Government use when lifecycle cost effective. See Paragraph 6, PROJECT SPECIFIC REQUIREMENTS for renewable energy requirements for this project.
- 5.10. FIRE PROTECTION
- 5.10.1. STANDARDS AND CODES Provide the fire protection system conforming to APPLICABLE CRITERIA.
- 5.10.2. Inspect and test all fire suppression equipment and systems, fire pumps, fire alarm and detection systems and mass notification systems in accordance with the applicable NFPA standards. The fire protection engineer of record shall witness final tests. The fire protection engineer of record shall certify that the equipment and systems are fully operational and meet the contract requirements. Two weeks prior to each final test, the contractor shall notify, in writing, the installation fire department and the installation public work representative of the test and invite them to witness the test.
- 5.10.3. Fire Extinguisher Cabinets: Provide fire extinguisher cabinets and locations for hanging portable fire extinguishers in accordance with NFPA 10 Standard for Portable Fire Extinguishers.
- 5.10.4. Fire alarm and detection system: Required fire alarm and detection systems shall be the addressable type. Fire alarm initiating devices, such as smoke detectors, heat detectors and manual pull stations shall be addressable. When the system is in alarm condition, the system shall annunciate the type and location of each alarm initiating device. Sprinkler water flow alarms shall be zoned by building and by floor. Supervisory alarm initiating devices, such as valve supervisory switches, fire pump running alarm, low-air pressure on dry sprinkler system, etc. shall be zoned by type and by room location.
- 5.10.5. Fire Protection Engineer Qualifications: In accordance with UFC 3-600-01, FIRE PROTECTION ENGINEERING FOR FACILITIES, the fire protection engineer of record shall be a registered professional engineer (P.E.) who has passed the fire protection engineering written examination administered by the National Council of Examiners for Engineering and Surveys (NCEES), or a registered P.E. in a related engineering discipline with a minimum of 5 years experience, dedicated to fire protection engineering that can be verified with documentation.

5.11. SUSTAINABLE DESIGN

5.11.1. STANDARDS AND CODES: Sustainable design shall conform to APPLICABLE CRITERIA. See paragraph 6, PROJECT-SPECIFIC REQUIREMENTS for which version of LEED applies to this project. The LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects (AGMBC) applies to all projects. Averaging may be used for LEED compliance as permitted by the AGMBC but is restricted to only those buildings included in this project. Each building must individually comply with the requirements of paragraphs ENERGY CONSERVATION and BUILDING WATER USE REDUCTION.

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5.11.2. LEED RATING, REGISTRATION, VALIDATION AND CERTIFICATION: See Paragraph PROJECT-SPECIFIC REQUIREMENTS for project minimum LEED rating/achievement level, for facilities that are exempt from the minimum LEED rating, for LEED registration and LEED certification requirements and for other project-specific information and requirements.

- 5.11.2.1. Innovation and Design Credits. LEED Innovation and Design (ID) credits are acceptable only if they are supported by formal written approval by GBCI (either published in USGBC Innovation and Design Credit Catalog or accompanied by a formal ruling from GBCI). LEED ID credits that require any Owner actions or commitments are acceptable only when Owner commitment is indicated in paragraph PROJECT-SPECIFIC REQUIREMENTS or Appendix LEED Project Credit Guidance
- 5.11.3. OPTIMIZE ENERGY PERFORMANCE.: Project must earn, as a minimum, the points associated with compliance with paragraph ENERGY CONSERVATION. LEED documentation differs from documentation requirements for paragraph ENERGY CONSERVATION and both must be provided. For LEED-NC v2.2 projects you may substitute ASHRAE 90.1 2007 Appendix G in its entirety for ASHRAE 90.1 2004 in accordance with USGBC Credit Interpretation Ruling dated 4/23/2008.
- 5.11.4. COMMISSIONING. See paragraph 5.8.5 COMMISSIONING for commissioning requirements. USACE templates for the required Basis of Design document and Commissioning Plan documents are available at http://en.sas.usace.army.mil (click on Engineering Criteria) and may be used at Contractor's option.
- 5.11.5. DAYLIGHTING. Except where precluded by other project requirements, do the following in at least 75 percent of all spaces occupied for critical visual tasks: achieve a 2 percent glazing factor (calculated in accordance with LEED credit EQ8.1) OR earn LEED Daylighting credit, provide appropriate glare control and provide either automatic dimming controls or occupant-accessible manual lighting controls.
- 5.11.6. LOW-EMITTING MATERIALS. Except where precluded by other project requirements, use materials with low pollutant emissions, including but not limited to composite wood products, adhesives, sealants, interior paints and finishes, carpet systems and furnishings,
- 5.11.7. CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT. Except where precluded by other project requirements, earn LEED credit EQ 3.1 Construction IAQ Management Plan, During Construction and credit EQ 3.2 Construction IAQ Management Plan, Before Occupancy.
- 5.11.8. RECYCLED CONTENT. In addition to complying with section RECYCLED/RECOVERED MATERIALS, earn LEED credit MR4.1, Recycled Content, 10 percent except where precluded by other project requirements.
- 5.11.9. BIOBASED AND ENVIRONMENTALLY PREFERABLE PRODUCTS. Except where precluded by other project requirements, use materials with biobased content, materials with rapidly renewable content, FSC certified wood products and products that have a lesser or reduced effect on human health and the environment over their lifecycle to the maximum extent practicable.
- 5.11.10. FEDERAL BIOBASED PRODUCTS PREFERRED PROCUREMENT PROGRAM (FB4P). The Farm Security and Rural Investment Act (FSRIA) of 2002 required the U.S. Department of Agriculture (USDA) to create procurement preferences for biobased products that are applicable to all federal procurement (to designate products for biobased content). For all designated products that are used in this project, meet USDA biobased content rules for them except use of a designated product with USDA biobased content is not required if the biobased product (a) is not available within a reasonable time, (b) fails to meet performance standard or (c) is available only at an unreasonable price. For biobased content product designations, see http://www.biopreferred.gov/ProposedAndFinalItemDesignations.aspx.
- 5.12. CONSTRUCTION AND DEMOLITION (C&D) WASTE MANAGEMENT: Achievement of 50% diversion, by weight, of all non-hazardous C&D waste debris is required. Reuse of excess soils, recycling of vegetation, alternative daily cover, and wood to energy are not considered diversion in this context, however the Contractor must tracked and report it. A waste management plan and waste diversion reports are required, as detailed in Section 01 57 20.00 10, ENVIRONMENTAL PROTECTION.
- 5.13. SECURITY (ANTI-TERRORISM STANDARDS): Unless otherwise specified in Project Specific Requirements, only the minimum protective measures as specified by the current Department of Defense Minimum

Antiterrorism Standards for Buildings, UFC 4-010-01, are required for this project. The element of those standards that has the most significant impact on project planning is providing protection against explosives effects. That protection can either be achieved using conventional construction (including specific window requirements) in conjunction with establishing relatively large standoff distances to parking, roadways, and installation perimeters or through building hardening, which will allow lesser standoff distances. Even with the latter, the minimum standoff distances cannot be encroached upon. These setbacks will establish the maximum buildable area. All standards in Appendix B of UFC 4-010-01 must be followed and as many of the recommendations in Appendix C that can reasonably be accommodated should be included. The facility requirements listed in these specifications assume that the minimum standoff distances can be met, permitting conventional construction. Lesser standoff distances (with specific minimums) are not desired, however can be provided, but will require structural hardening for the building. See Project Specific Requirements for project specific siting constraints. The following list highlights the major points but the detailed requirements as presented in Appendix B of UFC 4-010-01 must be followed.

- (a) Standoff distance from roads, parking and installation perimeter; and/or structural blast mitigation
- (b) Blast resistant windows and skylights, including glazing, frames, anchors, and supports
- (c) Progressive collapse resistance for all facilities 3 stories or higher. Unless determined otherwise by the Installation and noted in paragraphs 3 or 6, the building shall be considered to have areas of uncontrolled public access when designing for progressive collapse.
- (d) Mass notification system (shall also conform to UFC 4-021-01, Mass Notification Systems)
- (e) For facilities with mailrooms (see paragraph 3 for applicability) mailrooms have separate HVAC systems and are sealed from rest of building

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6.0 PROJECT SPECIFIC REQUIREMENTS JOINT BASE LEWIS-MCCORD (JBLM), WA

6.1. GENERAL

The requirements of this paragraph augment the requirements indicated in Paragraphs 3 through 5.

6.2. APPROVED DEVIATIONS

The following are approved deviations from the requirements stated in Paragraphs 3 through 5 that only apply to this project.

None

6.3. SITE PLANNING AND DESIGN

6.3.1. Site Planning Considerations

- 6.3.1.1. Site Planning, Design, and Construction Objectives: The Contractor is responsible for the site planning, design, and construction of all functional and technical requirements listed in this project, including erosion control measures, underground conduit, piping, utility service lines and connections (electrical, communications, cable, water, sewer, stormwater, gas, mechanical), etc.
- 6.3.1.2. Sidewalks: Provide 6-foot-wide minimum paved walkways to the entrance(s) of the building, around the building perimeter or all areas within the building complex, including courtyards.
- 6.3.2. Site Structures and Amenities
- 6.3.2.1. Site Furniture and Equipment:
- (a) Exterior seting at Battalion Headquarters is preferred. Do not fabricate seating and tables of wood.
- (b) Bicycle racks at all regularly occupied facilities with rack capacities consistent with LEED credit reuirements. Provide racks fabricated of corrosion resistant materials. Place all bike racks outside of the unobstructed space per UFC 4-010-1. Racks shall be mounted on concrete pads and anchored into the pad.
- (c) Fencing as indicated for security or safety barriers. Fencing shall be galvanized, vinyl coated, or aluminum-coated, chain-link.
- (d) Physical barriers, including concrete filled steel pipe bollards and vehicle gates, as required by antiterrorism or traffic control design.
- (e) Fabricate waste receptacles of durable, corrosion-resistant materials.
- (f) Flagpoles are required at BNHQ facilities. Provide free-standing poles, 25-feet in height above surrounding ground plane. Flagpoles shall resist a 3-second duration wind gust of 85 mph. Provide brushed natural aluminum, tapered from top to bottom, with 6-inch-diameter aluminum top ball.
- 6.3.3. Site Functional Requirements:
- 6.3.3.1. Stormwater Management (SWM) Systems.
- (a) The Contractor is responsible for design, development, and installation of all stormwater facilities at their respective sites. Design and size stormwater facilities d to accommodate stormwater runoff from all site development surfaces and all runoff from buildings.
- (b) JBLM prefers stormwater infiltration methods that are small and distributed throughout the project site and less visually obtrusie. Preferred methods may include use of such elements as car parks, rain garden, porous pavement, and underground filtration systems.
- (c) The use of underground injection to manage stormwater runoff must be in accordance with Chapter 173-218 WAC. New injection facilities must meet the non-endangerment standard as defined in the WAC and be registered with the State through the JBLM Stormwater Office prior to being constructed.

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(d) If underground injection is going to be used to manage stormwater, comply with the DOE's *Guidance for UIC Wells that Manage Stormwater* (latest edition).

- (e) Where low-impact development techniques are used, comply with the Low Impact Development Technical Guidance Manual for Puget Sound.
- (f) Under separate contract, the WT Complex Barracks Contractor has provided the stormwater management design for the WT Complex. The combined CO/BnHQ and SFAC Facility contractor shall be responsible for design, development, and installation of all stormwater systems from the building and any drainage surface in and around the building within the construction limits, and make connection to stormwater lines as installed by the WT Complex Barracks contractor.

6.3.3.2. Erosion and Sediment Control

Nothing to input

6.3.3.3. Vehicular Circulation.

The Contractor will be responsible for parking lots for the facilities. POV parking requirements are shown in the Drawings.

- 6.4. SITE ENGINEERING
- 6.4.1. Existing Topographical Conditions
- 6.4.1.1. See the Drawings for topographic survey, demolition plan, site layout plan, site utility plan, and site grading plan drawings. Information shown is approximate. A three dimensional digital topographic file is included as part of this RFP. The Contractor shall be responsible to obtain corrected survey data from any subsequent changes from the time the survey information was obtained to the present. Contractor will field verify surface and utility elevations. Use NAVD 88 datum for the vertical datum. Bring any discrepancies which are found in the furnished survey to the immediate attention of the Government for Clarification.
- 6.4.1.2. Site Grading: Provide site grading to facilitate drainage and provide functional building, parking, and laydown areas. Site grading includes clearing and grubbing for access drives, parking lots, and any site development. Provide all foundation, subbase, and building floor slabs, including final grading material and compaction.
- 6.4.2. Existing Geotechnical conditions: See Appendix A for a preliminary geotechnical report.
- 6.4.3. Fire Flow Tests See Appendix D for results of fire flow tests to use for basis of design for fire flow and domestic water supply requirements.
- 6.4.3.1. See Appendix D for results of fire flow tests to use for basis of design for fire flow and domestic water supply requirements.
- 6.4.3.2. Anticipated water service connection points are identified in the Appendices.
- 6.4.3.3. The installation has recently experienced loss of water pressure and adequate supplies are suspect in many locations. Sufficient water supply may not be available for this project. See hydrant flow test information provided in Appendix D, but may not be indicative of the actual flow. Repairs to all reservoirs are ongoing, and anticipated for next two years that require the post to empty the tanks. No more than two are authorized to be emptied at a time.

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6.4.4. Pavement Engineering and Traffic Estimates:

The Contractor will be responsible for all roadway improvements and parking lots for the facilities. Design procedures and materials shall conform to the applicable criteria. Provide on-street parking, continuous sidewalks, with pedestrian bulb-outs at intersections and planting strips along all streets as required by the JBLM Master Plan (standard width for planting strip is 15' with street trees at 20-30' on center and the standard width for sidewalks is 6', unless otherwise required by the JBLM Master Plan)

The WT Barracks contractor will be responsible for all roadway improvements and parking lots for the facilities as per separate contract.

6.4.5. Traffic Signage and Pavement Markings: Provide marked bike lanes on all roads per locations identified on the JBLM Master Plan.

6.4.6. Base Utility Information

- 6.4.6.1. General Utilities: Provide tracer wire directly above non-metallic lines and install marking tape. Exercise care when excavating trenches in the vicinity of trees. Where roots are 4-inches in diameter or greater, the excavate the trench by hand and tunnel. When large roots are exposed, wrap them with moist heavy burlap for protection and to prevent drying. Hand trim sides of trenches dug by machines adjacent to trees having roots less than 4-inch diameter making a clean cut of the roots. Backfill trenches having exposed tree roots within 24 hours unless adequately protected by moist burlap or canvas. Exercise care to avoid compacting and polluting the soil in the root zone of trees to remain. Exercise care to minimize damage to tree trunks and branches by installing a temporary fence around each tree at its drip line.
- (a) Provide meters with equipment to connect to DDC/BAS/UMCS capabilities for monitoring utility use and leak detention by JBLM. Hardwire the meter connections to the DDC/BAS/USMC to the DDC system; don't use the wireless type.
- (b) Electrical Service Maps: JBLM Public Works, Exterior Electric Shop owns and operates the electrical distribution system. Point of Contact: Jose L Solis, Electrical System Manager Engineer, 253-966-0143; and Ron Cottrill, 253-967-5840.
- (c) Telecommunications: The National Enterprise Center (NEC), operates the Army communications system at Fort Lewis. Point of Contact: Gary Schroeder; 253-967-3870.
- (d) Security: Coordinate Physical Security requirements through JBLM Physical Security. Point of Contact: Mr. Criss Christian, 253-966-7153.
- (e) Cable TV Service: Comcast provides Cable TV service. Point of Contact: Scott Morrison, Engineering Construction Coordinator, Comcast Cable, 410 Valley Avenue NW, Building C, Puyallup, WA 98371, 253-864-4350.
- (f) Qwest provides local telephone service at JBLM. Point of Contact: Robert Blair, Senior Design Engineer, Qwest Communications, 2410 South 84th Street, Suite 18, Lakewood, WA 98499, 253-597-5192
- (g) Exterior Utility Installation: Where new utilities cross roads, driveways, and parking lots to be paved under this contract, install utilities prior to paving. If paving has occurred prior to installing the utilities, jacking or boring is required. It is preferred to jack and bore utilities under all existing paved roads, but open cut excavation is allowed if the pavement cut width is a minimum of 15-feet wide across the entire width of the road. Install new utilities that connect to existing utilities located under existing paved areas by open cut excavation. A minimum 15-foot pavement cut width is required for all open cut excavations.

6.4.6.2. Sanitary Sewer Service

(a) General: To demonstrate the integrity of the installed material and construction procedures, the Contractor shall conduct final air testing after the finished grading, landscaping, and paving is accomplished; all other underground utilities have been installed; and the lines have been flushed, cleaned, deflection tested, and television inspected. For ductile iron pipe, the testing shall be in accordance with the applicable requirements of ASTM C 924. Allowable pressure drop shall be as given in ASTM C 924. Make calculations in accordance with the appendix to ASTM C 924. For PVC pipe, the testing shall be in accordance with UBPPA UNI-B-6. Allowable pressure drop shall be as given in UBPPA UNI-B-6. Make calculations in accordance with the appendix to UBPPA UNI-B-6. The Contractor may be required to retest the system if warranted by the contracting agency.

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- (b) Prior to final inspection, test, flush, clean, and remove all debris from all pipelines. Flush a pipeline "cleaning ball" of the proper diameter for each size of pipe through all pipelines prior to final inspection.
- (c) Before sewer lines are accepted, conduct a closed-circuit television inspection, using color video equipment with pan-and-tilt capabilities of the sewer pipe and appurtenances in the presence of the Contracting Officer, and provide two copies of the VHS videotapes to the Contracting Officer.
- (d) Not Used
- (e) Install a boot/equipment wash system. Discharge the boot wash system to the sanitary sewer system. Site it to minimize rain intrusion, and install an adequate oil/water/grit separator system to prevent direct discharge of non-sanitary waste into the collection system.

6.4.6.3. WATER SERVICE

- (a) **General:** Provide material for and installation of water system to provide for domestic use and required hydrant flow to meet NFPA 24 and NFPA13. NFPA 13 requires clearances around the main riser to prevent damage of piping subjected to earthquakes. Provide water service and fire lines of ductile-iron pipe or polyvinyl chloride (PVC) plastic water main pipe. Provide water service appurtenances as required. Do not install utilities under the footprint of a building. Supply a fire-line off the domestic water system with PIV with tamper switch per NFPA 24 standards to supply the building's interior fire suppression system.
- (b) Pressure test all tapping sleeves and tapping valves prior to making connection to existing mains.
- (c) If backflow prevention devices are required for installation on the distribution system, add the following references to the specifications.
- American Water Works Association (AWWA)
- Cross Connection Control Manual (latest edition)
- Cross Connection Control Committee, Pacific Northwest Selection
- (1) Backflow Prevention Assemblies shall be approved by the Washington State Department of Health (DOH) for installation in Washington State. The most current list of approved assemblies is available from the DOH test reports, showing name of the manufacturer of the BPA, the manufacturer's serial number, test date, test results, tester's name, and tester's certificate number.
- (2) Reduced pressure principle assemblies, double-check valve assemblies, atmospheric (nonpressure) type vacuum breakers, and pressure-type vacuum breakers shall be tested, approved, and listed in accordance with FCCHR-01 and in accordance with DOH Standards. Backflow preventers with intermediate atmospheric vent shall conform to ASSE 1012. Reduced pressure principle backflow preventers shall conform to ASSE 1013. Hose connection vacuum breakers shall conform to ASSE 1011. Pipe applied atmospheric-type vacuum breaker shall conform to ASSE 1001. Air gaps in plumbing systems shall conform to ASME A112.1.2. Backflow devices must be approved by DOH for installation in Washington State.
- All testable Backflow Prevention Assemblies (reduced pressure backflow assembly, double-check valve assembly, and pressure vacuum breaker) shall be tested and a test report form shall be completed, and submitted to the Contracting Officer (to be forwarded to the installation water systems manager). Test procedures and criteria shall be in conformance with recommendations published in AWWA Cross Connection Control Manual, Section 6, Requirements for Equipment Approval and Testing. Fittings in areas shown on the plans for restrained joints shall be mechanical joint fittings with a mechanical joint restraint device. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1.
- (d) All fire hydrants will be center stem-dry barrel, and paint the barrels nutmeg brown. PANTONE 18-1222 PTX. Install hydrants with 6-inch shutoff gate valve for easy maintenance and service. Fit fire hydrants with 5-inch Stortz adapters. Provide a fire department connection within 150 feet of a fire hydrant and install a PIV valve. Hydrants shall not be further than 40 feet from the building, and no closer than 25 feet. Locate them not less than 3 feet and no more than 7 feet from a paved traffic rated surface. Do not locate closer than 10 feet to any obstruction or near an entranceway. Install the suction connection perpendicular to the nearest roadway.
- (e) The flow tests were conducted in the vicinity of the project sites and can be found in Appendix D. Any additional flow testing will be the responsibility of the Contractor, if deemed necessary and for the portion of their respective development activity. Conduct any additional water flow testing in accordance with NFPA 291, Recommended Practice for Fire-Flow Testing and Marking of Hydrants. Hydrant barrel shall be collared with two reflective metal backed collars and numbered to provide pumper operators with an indication of available flow. Classify hydrants in accordance with their rated capacities (at 20 psi residual pressure or other designated value):

Class AA – Light blue - Rated capacity of 1,500 gpm or greater (5,680 L/min)

Class A – Green - Rated capacity of 1,000 to 1,499 gpm (3,785 to 5,675 L/min)

Class B – Orange – Rated capacity of 500 to 999 gpm (1,900 to 3,780 L/min)

Class C – Red – Rated capacity of less than 500 gpm (1,900 L/min)

- (f) If not already in place, secure a blue double-sided reflectorized raised pavement marker in the road near center line for each hydrant. In addition to collaring, install a metal tag on each hydrant that indicates the hydrant number, with the Global Positioning System (GPS) location. Establish a GPS location for each fire hydrant. This tag will provide a secondary indicator to operator should the marking be removed from each. Submit hydrant test and installation report to the Contracting Officer (to be forwarded to the installation water systems manager).
- (g) All water meters shall be read in U.S. gallons, have frost protection design if appropriate, shall have bronze casing when available, and have permanently sealed registers. Register type shall be an encoder-type remote register designed in accordance with AWWA C707. Supply and install all domestic water meters needed for each project site. Provide water meter with equipment to connect to DDC/BAS/UMCS system for monitoring by JBLM
- (h) Meter boxes shall be concrete with cast-iron lid and cast-iron meter reader lid. Use plastic boxes and lids in unpaved areas or grass areas not subject to vehicular traffic.
- (i) Water Systems North Fort: Battalion Headquarters B: The water mains are currently under construction and will be in place to make lateral connections. Coordinate with the Contracting Officer to obtain up-to-date plans during the design phase.
- (j) Water Systems Jackson: Battalion Headquarters A and B: Extend service from the existing water main in Evergreen. Lawnmower Storage Buildings: Water is not supplied to Lawnmower StorageBuildings (LSB's).

6.4.6.4. GAS SERVICE

- (a) General: Puget Sound Energy (PSE), 888-321-7779, owns and operates the gas distribution system on JBLM. Therefore, local utility standards as determined by PSE for installation of natural gas facilities shall take precedence over any references made in this document to natural gas facilities installation methods, means, and materials. Provide all meters with a pulse meter sensor compatible with the JBLM DDC/BAS/UMCS system for monitoring. JBLM owns and operates the propane fuel distribution system. Coordinate and contract with PSE for the installation of the natural gas piping up to and including the meter to all facilities at their respective sites. Include the PSE's installation cost, including meter, in the contract price. Provide the meter with equipment to connect to DDC/BAS/UMCS system for monitoring. See Appendix C for exhibit representing the location of the existing natural gas main.
- (b) Gas Line Locations: Anticipated gas line locations are identified in Appendix C of this RFP.
- (c) Propane Fuel Distribution System: JBLM owns and operates the propane fuel distribution system. Install the propane facilities with a minimum separation of 36 inches from PSE's natural gas pipe. Connect piping downstream of the building's natural gas meter to the back of sidewalk along the street and cap piping so that connections can be made in the future to the propane-air distribution system. In addition, install yellow pipe with black striping in order to further distinguish the two facilities.
- (d) Utility Pads: Install all concrete utility pads located outside the building exterior for any mechanical or utility device needed for the building operation and function. Include all necessary piping, wiring, or utility extensions for the device to function as designed. Locate mechanical equipment next to existing or proposed sidewalks, pathways, or parking areas to eliminate the need to construct additional hard surface access. All utility pads with equipment shall meet antiterrorism/force protection standards.

6.4.7. Cut and Fill

Cut and fill should equal out where possible.

6.4.8. Borrow Material

- 6.4.8.1. Obtain borrow material from licensed and permitted sources off government property. Obtain all fill off post and at their expense. See 6.17.2 for disposal of material.
- 6.4.9. Haul Routes and Staging Areas

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Adhere to the haul route and laydown areas as directed by the Contracting Officer. Laydown areas are shown on drawings in Appendix C. Restore the laydown areas to its original condition after construction is complete.

6.4.10. Clearing and Grubbing:

- (a) Clear and grub all trees and vegetation necessary for construction, but save as many healthy trees as possible. Consider alternatives of the site orientation to preserve existing trees. Unless otherwise noted, a qualified tree specialist (International Society of Arboriculture (ISA) Certified Arborist, urban forester, or horticulturist) shall determine the health and safety of trees. Protect trees within the project site limits by a fence around a tree directly under its outermost branch tips. Crown-prune existing trees to be preserved to remove all dead, broken, or crossing branches within the crown of the tree. Accomplish pruning by trained and experienced personnel in accordance with ANSI A300. Remove all flagging, paint, hardware, or other man-made products from trees to remain prior to completion of landscaping. Replace any existing vegetation designated to remain that is damaged during the work under this contract in kind with a minimum 5 feet high, in accordance with UFGS 01 57 20.00 10 ENVIRONMENTAL PROTECTION.
- (b) All timber removed from the project shall remain the property of the Government, unless otherwise indicated or specified. Pile merchantable trees removed during construction for subsequent disposal by the Government. Pile coniferous tree stems separately from deciduous tree stems. A merchantable tree is defined as a tree with a small end diameter of at least 4 inches and 16 feet in length. Cut trees from the stump and limb (flush to the trunk) out to a 4-inch diameter. Top tees at 4-inch diameter and from this point to the top of the tree shall be considered unmerchantable (slash). Whenever possible, do not cut trees into log lengths. If trees are too large to be handled tree length, cut 41-foot logs from the butt end until a manageable length is achieved. Pile tree length logs separately from all shorter material (cut and broken logs). Locate piles as directed by PW, Engineering and Contract Management Division. Locate piles so as not to interfere with construction work and so they will be accessible at a later date for disposal action. Piles shall not exceed 8 feet in height.
- (c) To maintain the highest potential cost recovery to the Government, fell and buck trees into preferred lengths prior to being removed from the site for storage. Preferred lengths are as follows: 41'-10", 38'-10", 36'-10", or 32'-10". Acceptable lengths include 2-foot multiples less than 32'-10" down to 16'-10". Merchandise all logs down to a 4-inch top. Merchanize log lengths to exclude volume defects.
- (d) Remove material and soils to be stripped or grubbed to a depth recommended by the contractor's geotechnical engineer. Remove tree stumps by grinding to a minimum depth of 18 inches below original ground surface. If the stump is within the drip-line of a preserved tree, grind the tree stump to grade level only. Fill depressions made by grubbing with suitable material and compact to make the surface conform to the original adjacent surface.

6.4.11. Landscaping:

The Contractor is responsible for the landscaping within the project construction limits

6.4.11.1. Tree Preservation Plan: Provide a Tree Preservation and Protection Plan to COE for approval before any clearing and grading can take place. The Tree Preservation Plan must follow JBLM' Urban Forest Management requirements included in Appendices P and Q.

Replace oak trees that cannot be preserved at the ratio of six new to every one removed. Contact the Contracting Officer for guidance on locations for planting new oak trees.

- 6.4.11.2. Existing Plant Materials: Retention of existing plant materials, particularly mature trees, is preferred. Protect the root zone and foliage of materials being retained. Where trees and other vegetation must be cleared from a site, mark trees and confirm planned clearing with Contracting Officer prior to cutting.
- 6.4.11.3. New Plant Materials: Only use of drought tolerant, insect and disease resistant species native to western Washington is authorized. Provide trees, shrubs, groundcovers and grasses consistent with existent plantings. Minimize the use of ornamental turf areas. Review Appendix Ifor lists of acceptable and prohibited plant materials. New plant materials shall meet the following criteria.
- (a) Able to withstand weather extremes likely to occur in any 10-year period without supplemental irrigation or seasonal protection.
- (b) Acclimated to western Washington State for a period of one growing season.

- (c) Low-maintenance varieties without significant pruning and thinning requirements.
- (d) Supplemental irrigation is acceptable for turf varieties used at lawns and training areas.
- (e) Plant trees and shrubs in locations that will avoid contact with building when mature.
- 6.4.11.4. Warranty. Guarantee furnished plant material to be in a vigorous growing condition for a period of 12 months regardless of the contract time period. Replace a plant one time under this guarantee. Transplanting existing plants requires no guarantee.
- 6.4.11.5. Landscape Design: Provide landscaping schemes that are consistent with the function of the facility, contextually compatible with existing landscape design in the vicinity, and in accord with the sustainable design goals of the project. Provide continuity with existing landscapes, including continuation of adjacent lawns, shrub beds, street tree plantings, and similar features. Provide landscaping over all site areas not covered with buildings, pavement, or other nonvegetative surfacing. Landscape design should provide a professional and natural appearance to all sites while minimizing water consumption and the amount of recurring labor necessary for maintenance. Design shall incorporate the following.
- (a) Conformance with antiterrorism design standards.
- (b) Screening of parking, service areas, and utility equipment from adjacent streets.
- (c) Landforms and practices consistent with minimization of erosion.
- (d) Concrete mow strips to separate lawn areas from shrub beds and gravel beds.
- (e) Mulch at all shrub beds.
- 6.4.11.6. Irrigation Systems: Where plant materials selected require permanent irrigation, provide irrigation that is consistent with project sustainability goals and installation water conservation initiatives, exposure, and service. Where xeriscape planting is developed, provide temporary irrigation necessary to maintain plant materials until established. Provide supplemental irrigation during plant establishment periods.
- (a) Irrigation control shall be automatic, easily programmable for weekly adjustment, and capable of providing separate frequency, time and duration settings for each zone. Locate all controllers in facility electrical rooms in a common wall area. Do not locate irrigation equipment within turf areas to receive foot traffic. Prevent contamination of potable water by irrigation water.
- (b) Design irrigation systems to minimize the risk of damage from freezing. Provide connections at the head end of systems to accommodate seasonal evacuation of water using air pressure. Provide manual drain valves to gravel basins as required for drainage.
- (c) Underground irrigation piping shall be PVC plastic pipe (Schedule 40) or polyethylene plastic pipe. Use overhead spray (gear or rotor) heads at lawn areas and drip or bubbler hoses or heads at tree, shrub, and groundcover beads.
- (d) Irrigation Capacity: Sufficient to maintain landscape plantings with maximum contribution by precipitation equal to the Precipitation Allowance.
- (1) Precipitation Allowance: 25 percent of normal rainfall, maximum, in any month.
- (2) Application Rate: Enough water to soak soil to depth of 6 inches at each application; intermittent applications, if necessary, to avoid saturation to runoff; adjustable for less water on damp soil.
- (3) Irrigation Efficiency: 55 percent, minimum, of applied water actually reaching plants, under normal wind conditions.
- (4) Locations of Irrigation Equipment: To provide complete coverage of landscaped area requiring irrigation, without overspray or runoff onto pavements, buildings, or unirrigated planted areas.
- (5) Variation in Application Rate at Individual Locations: Not more than 25 percent.
- (6) Sloped Areas: Prevent drainage out of lower outlets. Program to avoid runoff.
- (7) Operating Pressure: As low as possible as is compatible with results.

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- 6.4.11.7. Water Conservation: All landscape design shall incorporate water conservation consistent with JBLM regulation 11-5 for reduction of water consumption. Provide design consistent with the following requirements.
- (a) Irrigation control shall be automatic, easily programmable for weekly adjustment, and capable of providing separate frequency, time and duration settings for each zone. Locate all controllers in facility electrical rooms in a common wall area. Do not locate irrigation equipment within turf areas to receive foot traffic. Prevent contamination of potable water by irrigation water.
- (b) Design irrigation systems to minimize the risk of damage from freezing. Provide connections at the head end of systems to accommodate seasonal evacuation of water using air pressure. Provide manual drain valves to gravel basins as required for drainage.
- (c) Underground irrigation piping shall be PVC plastic pipe (Schedule 40) or polyethylene plastic pipe. Use overhead spray (gear or rotor) heads at lawn areas and drip or bubbler hoses or heads at tree, shrub, and groundcover beads.
- (d) Irrigation Capacity: Sufficient to maintain landscape plantings with maximum contribution by precipitation equal to the Precipitation Allowance.
- (e) Estimated Evapotranspiration: Equal to Potential Evapotranspiration times Average Plant Factor, in inches per year.
- (f) Potential Evapotranspiration: Inches per month for each month of year, for reference crop of 4-inch high well-watered grass, as determined by government or educational agricultural or irrigation information agency for actual project location.
- (g) Average Plant Factor: Average of plant factor of each different hydrozone based on relative areas of each, using plant factors as follows (or otherwise documented by research as relative to evapotranspiration of reference crop of 4-inch high well-watered grass).
- (1) Native Plants: Defined as plants that grow in the wild in natural local climate, or other plants and turf of equivalent climatic endurance requiring no supplementary irrigation; plant factor of 0 (zero).
- (2) Low Water-Using Plants: Plants proven to be able to survive significant periods without water in the local climate without degradation of appearance; 0.3.
- (3) Warm-Season Grasses: 0.6.
- (4) Cool-Season Grasses: 0.8.
- (5) Moderate Water-Using Plants: Plants proven to be able to survive periods without water in the local climate but with significant degradation of appearance; 0.8.
- (6) Flowering Plants, when in Flower: 1.20.
- (7) Area within Drip Line of Trees: 1.0; regardless of other type of planting.
- (8) All Other Plants: 1.0.
- (h) Irrigation Efficiency: As calculated or designed for actual system provided.
- 6.4.11.8. Topsoil: Provide topsoil, whether native from the site or imported, for landscaped areas meeting the following criteria.
- (a) Conform to the USDA textural class with a pH of 6.5 to 7.0 for lawn/turf areas.
- (b) Conform to the USDA textural class with a pH of 7.5 to 8.5 for planting areas.
- (c) Maximum particle size is 3/4 inch.
- (d) Matter content between 5 to 20 percent by volume or 2 to 7 percent by weight.

Perform soil tests of native and imported topsoil to establish chemical, mechanical, and nutrient character. Amend the backfill topsoil mix for landscaped areas for improved plant growth and water holding capacity as indicated by the soil test. Ensure sufficient topsoil material for landscape plant establishment, ease of maintenance requirements and longevity of successful landscape design. Provide minimum topsoil depth of 8 inches at all lawn and field grass areas. Provide minimum topsoil depth of 18 inches at all shrub beds.

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6.4.11.9. Mulch: Mulching practices for all planting material, such as trees, shrubs, and planting beds, will be in accordance with industry standard for commercial landscape areas. Mulch will be free of weeds to promote germination and seedling establishment. Hydromulch will be applied using the recommended rate of an organic tackifier. Erosion control blankets will be used whenever reclaiming slopes greater than 3:1 or along drainage areas where erosion is probable. Use nonwoven polypropylene or polyester fabric under bark.

6.4.12. Turf:

- 6.4.12.1. New Sod: All sod will be locally grown and State-certified as classified by applicable state laws and industry standard. Provide amendments to ensure successful turf establishment. Establish and maintain a healthy stand of turf.
- (a) Provide sod free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 2 inches in diameter, woody plant roots, and other material detrimental to a healthy stand of turf.
- (b) Dry moldy, yellow, irregularly shaped, torn or uneven end sod pieces are not acceptable.
- (c) Machine cut to a uniform thickness of 1 inch within a tolerance of 0.25 inch, excluding top growth and thatch.
- (d) Measurement for thickness does not include top growth and thatch.
- (e) Use sod anchors for sloped areas as recommended by the sod supplier.
- 6.4.12.2. Seed Mixes: Performed by the seed supplier prior to delivery to the site. Bulk quantities of seed shall be labeled.
- (f) Provide seed that does not contain mold or is otherwise damaged.
- (g) Provide seed that does not contain amounts of weed seed greater than 1 percent by weight of the total mixture, and will be free of restricted or prohibited noxious weed seed.
- (h) Provide seed free of crop seed. Inert matter shall not exceed 3 percent by weight of the total mixture.

6.5. ARCHITECTURE

6.5.1. General: To the maximum extent possible within the contract cost limitation, the buildings shall conform to the look and feel of the architectural style and shall use the same colors as adjacent facilities as expressed herein. The Government will evaluate the extent to which the proposal is compatible with the architectural theme expressed in the RFP during the contract or task order competition. The first priority in order of importance is that the design provides comparable building mass, size, height, and configuration compared to the architectural theme expressed herein. The second priority is that design is providing compatible exterior skin appearance based upon façade, architectural character (period or style), exterior detailing, matching nearby and installation material/color pallets, as described herein.

6.5.2. **Design**

- 6.5.2.1. Appendix F is provided "For Information Only", to establish the desired site and architectural themes for the area. Appendix F identifies the desired project look and feel based on JBLM's Installation Architectural Theme from existing and proposed adjacent building forms; i.e. building exterior skin, roof lines, delineation of entrances, proportions of fenestration in relation to elevations, shade and shadow effects, materials, textures, exterior color schemes, and organizational layout.
- 6.5.2.2. The design should address JBLM's identified preferences. Implement these preferences considering the following:
- (a) Achievable within the Construction Contract Cost Limitation (CCL)
- (b) Meets Milestones within Maximum Performance Duration.
- (c) Achieves Full Scope indentified in this Solicitation
- (d) Best Life-Cycle Cost Design
- (e) Meets the Specified Sustainable Design and LEED requirements.

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- (f) Complies with Energy Conservation Requirements Specified in this RFP.
- 6.5.2.3. Priority #1. Visual Compatibility: Facility Massing (Size, Height, Spacing, Architectural Theme, etc.) Exterior Aesthetic Considerations: The buildings massing, exterior functional aesthetics, and character shall create a comprehensive and harmonious blend of design features that are sympathetic to the style and context of the Installation. The Installation's intent for this area is:

to provide facilities that are fundamentally sustainable, require minimum operation and maintenance inputs, reflect the military hierarchy of their occupants and match the Architectural theme of the new WT Barracks located on the same site. The Architectural Theme for the new WT Barracks is included in Appendix F.

- 6.5.2.4. Priority #2. Architectural Compatibility: Exterior Design Elements (Materials, Style, Construction Details, etc.) Roofs, Exterior Skin, and Windows & Door Fenestrations should promote a visually appealing compatibility with the desired character while not sacrificing the integrity and technical competency of building systems.
- 6.5.2.5. See Appendix F for exterior colors that apply to Architectural character. The manufacturers and materials referenced are intended to establish color only, and are not intended to limit manufacturers and material selections.
- 6.5.2.6. Additional architectural requirements:
- (a) Install fall protection anchor points on all roofs with a slope greater than 2:12
- (b) Minimum roof slope for low slope roof systems is ¼ inch per foot and 4 inches per foot for steep slope roof systems. Low-slope roof systems may only be used where required in other sections of the RFP. Slope all other roofs at 4:12 minimum (5:12 preferred). Designs that avoid complex valleys and flashing and venting conditions are preferred. Protect all exterior personnel doors from the weather. Minimum thickness of roofing materials shall be in accordance with standards listed in Applicable Criteria.
- (c) Exterior Wall Mockups: Construct a 6'wide x6' high, full-size representation of the typical physical exterior wall assemblies, including trim and a sample of roofing material in themock-up wall, that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and qualities of actual materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged prior to selection of the final colors. Build mockup to verify selections made under sample submittals and to demonstrate aesthetic effects.
- (d) Exterior Insulation and Finish Systems (EIFS), if used, shall include high-impact reinforcement at grade level walls and rain screen or drainable design. Exposed exterior materials shall not require periodic repainting. Preferred materials are factory prefinished, integrally colored, or have similarly intrinsic weathering finishes. Ferrous metals shall not be exposed to the weather unless prefinished with a protective coating that has a minimum 20-year warranty. Exterior masonry surfaces shall be provided with a penetrating, breathable masonry sealer.
- (e) Exterior Doors: It is preferred that entry doors into lobbies and corridors be glazed aluminum storefront entry systems.
- (f) Exterior Windows: Operable windows with insect screens are preferred for all occupied spaces. Power operators shall only be provided for windows that are not within the normal reach range of personnel. Windows in sleeping room shall be provided with manufacturer's standard hardware to allow window to be opend for venting while preventing access through the opening from the outside.
- (g) Comply with provision applicable standards and with provision of Washington Administrative Code (WAC) 296-96 Elevator Safety Regulations, including inspections and certifications. Coordinate with Contracting Officer to ensure attendance by Elevator Inspector at necessary times during construction, inspection, and testing periods. Verify all critical construction activities that must be witnessed by the inspector and do not proceed with that portion of the work until the inspector is present.
- (b) All facilities shall be based on a the style of the new WT Barracks. Stylistic features include balanced fenestration & building elements laid out in a syncopated rhythm as illustrated in Appendix CC.
- (c) Windows shall be split into a daylighting portion and a view portion, with permanent interior and exterior architectural elements that prevent summer sun penetration to 90% of interior spaces, while

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allowing daylight and views.

(d) Exterior sunshades shall not require periodic maintenance to retain appearance or effectiveness.

- (e) The "golden section" (found in Appendix CC) should be used to set building proportioning and massing, vestibule entrances with exterior covered areas, hipped roofs, dormers or skylights for providing daylight to interior spaces of the facility, prominent chimneys, circular accent details or windows and exposed gutters with fascias.
- (f) Lower wall surfaces (to 2nd story floor level minimum for multi-story facilities and full wall height for single story facilities) shall be complementary in appearance and warm deep reddish-brown in color.
- (g) Complementary base and accent materials shall be masonry in appearance. Upper wall areas and larger accent panels on single story facilities shall be smooth in appearance and warm light neutral-toned in color.
- (h) Minimum roofs slope for low slope roof systems is 1/4 inch per foot and 4 inches per foot for steep slope roof systems. Low slope roof systems may only be used where required in other sections of the RFP. All other roofs shall be sloped at 4:12 minimum. Designs that avoid complex valleys, flashing and venting conditions are preferred. Minimum thickness of roofing materials shall be in accordance with standards listed in Applicable Criteria.
- (i) Use the same color palette of the new WT Barrack.
- 6.5.3. Programmable Electronic Key Card Access Systems:

All locking systems shall comply with keyless entry standards. Only communication rooms, mechanical rooms, and electrical rooms shall have a keying lock system with interchangeable cores.

- 6.5.3.1. Key Changing: All locks changeable without disassembly of lock cylinders; acceptable methods include interchangeable removable core cylinders.
- 6.5.3.2. Control of Lock Cores and Keying: Provide all hardware and construction (temporary) cores required to secure buildings, utility access, and related work throughout the construction period. Provide construction cores with a bright color on their exposed face for ease of identification. During construction, the Contractor shall meet with representatives of the Contracting Officer, Public Works Lock Shop, and the user to develop a keying schedule. Submit Schedule to Contracting Officer for approval. Provide final keying and combinations as performed by a licensed, bonded locksmith approved by the Contracting Officer. Upon acceptance of the facility for occupancy, replace construction cores with final cores in the presence of the government inspector and a Public Works locksmith, test each lock for proper operation and deliver any permanent or control keys to the inspector. Prior to core change out, provide the government, by security shipment, with keys tagged with identifying labels in the quantities indicated.
- 6.5.3.3. Authorized Locksmiths: The following locksmiths are currently approved by the JBLM Public Works Lock Shop to combinate cores for locksets used in this project. Verify that authorization remains current prior to beginning lock/core related work on this project.
- (a) Bassett Services: POC: Bob Bassett, 2111 Hernlock Ct SE, Lacey, WA 98503 (360) 239-4416
- (b) Beyond Security: POC: Julie Santie, 11420 Hwy 302 NW, Gig Harbor, WA 98329 (253) 720-7416
- (c) PD Services Unlimited: POC: Pam Johnson, 9508 356th St. S., McKenna, WA 98558 (360) 359-0811

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- (d) Security Unlimited: POC: Mike Pennella, 8205 E. Martin Way #188, Olympia, WA 98516 (360) 351-1774 (cell)
- 6.5.3.4. Cylinders and Cores: Provide cylinders and cores with six-pin tumblers for locks. Cylinders shall be products of one manufacturer, and cores shall be products of one manufacturer. Rim cylinders, mortise cylinders, and knobs of bored locksets shall have interchangeable core that are compatible with A-2 SFIC (A-2 system specifications are available at http://www.lab-lockpins.com/pinsicore.htm) and are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core. Cylinders shall be fully compatible with products of the Best Lock Corporation, Arrow Lock Corporation, or Falcon Lock. Submit a core code sheet with the cores. Provide cores master keyed in one system for this project. Provide construction interchangeable cores.
- 6.5.3.5. Kevs: Furnish four kevs for each lock core KD (keved different), and four kevs for each set KA (keved alike) to the Public Works Lock Shop for control and issuing. In addition to the keys listed above, furnish four additional key blanks per core KA. Stamp each key with appropriate key control symbol and "U.S. Property - Do No Duplicate". Key bows must be stamped with key code line ID (example: LA1223, MPA1223, etc.). All codes are one to four letters and one to four numbers. Public Works Lock Shop will provide ID information and Master control number to be used in combinating core. Do not place room number on keys.
- 6.5.3.6. Programmable Pushbutton Locksets: Hardware shall be programmable pushbutton locksets OSI Omnilock "OM500" for exterior doors and KABA "E-plex 5000" for all locking interior doors, except standard bored locksets shall be provided on mechanical, electrical, and telephone rooms. Programmable locks shall be provided with key override and interchangeable cores.
- 6.5.3.7. Mechanical, Electrical, and Communication Room Doors: Provide standard keyed locksets for these doors.
- 6.5.3.8. High Security Doors: Doors for vaults, secure document storage rooms, SIPRnet communications rooms, and similar spaces requiring a high level of physical security shall be provided with locks complying with the requirements contained in the security standards referenced for spaces designated under Functional Area Requirements paragraphs. These may include combination locks and other special hardware.

6.5.4. INTERIOR DESIGN

- 6.5.4.1. Special Signage: The following special signage is required.
- Fire Department Connection: Mount sign on the building above exterior fire department connection, and shall be a minimum of 20 by 15inches, mounted 6 feet above grade, with red text on white background.
- Gas Shutoff: Mount sign on the building above the natural gas meter and valve, and shall be a minimum of 20 by 15 inches, mounted 6 feet above grade, with red text on white background.
- Alarm System: Mount sign centered on all doors accessing rooms and spaces protected by alarm systems. Text at top of sign shall be as specified in AR 190-11, Appendix F. Bottom of sign shall have message in Braille.

6.6. STRUCTURAL DESIGN

- Design the facility assuming a ground snow load of 15 psf, Terrain Category C. However, design all roof structures for a minimum uniform roof snow load of 25 psf. An additional 5 psf rain-on-snow surcharge load shall be applicable in accordance with the requirements of ASCE 7.
- 6.6.2. Design the facility using a basic wind speed of 85 mph.
- Design the facility using a Spectral Response Accelerations (SRA) for 0.2 seconds, Ss=1.202. SRA for 1.0 second, S1=0.380.
- Extend bearing portions of substructure to levels below frostline, not less than 18 inches below grade.
- The structural system shall be compatible with building use. For example, do not locate columns in rooms requiring visibility or open space, such as entries, common areas, etc.

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6.7. THERMAL PERFORMANCE: No additional requirements. Enhanced thermal envelope may be used to improve energy performance in pursuit of lower energy usage and LEED point(s).

- 6.8. PLUMBING
- 6.8.1. PLUMBING FIXTURES: Plumbing fixtures shall include the following.
- 6.8.1.1. General: Where it is possible and economically feasible to use reclaimed water for such applications as irrigation, clearly label and mark all piping, fittings, equipment, and devices associated with such a system with the color purple.
- 6.8.1.2. Mop Sink: floor-mount type preferred.

No additional requirments.

- 6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS
- 6.9.1. Site Power
- 6.9.1.1. General: Electrical power distribution is a 13,800-volt, 3-phase, 3-wire single-point grounded wye system. JBLM has adopted Tacoma Public Utilities (TPU) utility design criteria and construction standards for all power distribution work performed on the post, except for requirements associated with single-point grounding. The "single-point grounding" portion of the distribution system applies to a single reference point to ground at the substations only. JBLM is, for all intent and purpose, a Delta, so the neutral conductor shown on the TPU details should be disregarded. Refer to TacomaPower.com for construction details and specifications and to JBLM Exterior Electric Shop for any questions regarding system requirements. Comply with the National Electrical Safety Code (NESC ANSI C-2), NFPA 70 and TPU standards for the Work of this Contract. JBLM standard details are available on http://designstandards.lewis.army.mil/index1.htm
- (a) Design, furnish, and install a 15kV class distribution system that extends from the existing system, provides power for the facilities in this project, and provides expansion capability for future projects. Coordinate the distribution system expansion with the Public Works Electrical System Manager Engineer and the Exterior Electric Shop.
- (b) Demolition: Turn over any existing distribution equipment required to be removed under this contract to the Public Works Exterior Electric Shop. Coordinate turnover with the Exterior Electric Shop Foreman.
- (c) Seismic Bracing: Brace or anchor distribution equipment to resist horizontal forces acting in any direction per the site class and seismic use group as defined in the International Building Code.
- (d) System Coordination Study: Provide a coordination study to demonstrate that the equipment selected and system constructed meets the contract requirements for equipment ratings, coordination, and protection. A registered professional engineer with demonstrated experience in power system coordination shall perform the study. Start coordination study at the first device located upstream of the equipment to be installed. Coordinate with JBLM electrical shop for upstream device information and for system fault currents.
- 6.9.1.2. Primary Duct Banks: Medium-voltage ducts shall be minimum 4-inch Schedule 40 PVC encased in Controlled Density Fill (CDF) except under roads or paved areas subject to vehicular traffic. Encase duct banks under roads or paved areas subject to vehicular traffic in reinforced concrete. A 36-inch minimum burial depth is required to the top of the concrete encasement. Provide a 6-inch metallic warning tape above primary duct banks at 12 inches below finished grade. Arrange ducts so that they enter manholes and vaults at the lowest point. Provide at least two spare ducts in all medium-voltage duct banks and a pull cord in all empty ducts. Provide a minimum #2 bare copper ground conductor in the duct bank encasement and ground the conductor in all vaults.
- 6.9.1.3. Medium-Voltage Conductors: All medium-voltage conductors shall be 15kV, EPR, CU, 133 percent insulation, with insulation shielding and a drain wire. Main feeders shall be 500kcmil with 600-ampere terminations; loop feeders shall be #4/0 AWG with 200-ampere terminations; and lateral feeders to transformers shall be #2 AWG.
- (a) Splicing: Where splicing is required, provide junction assemblies in an appropriately sized vault with a hinged diamond-plate lid. Angle assemblies upward to facilitate above-ground operation. All 200-ampere medium-

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voltage separable insulated connectors shall be of the load-break type. In-line and T-tap primary splices are not permitted. Provide test points on elbows at padmount transformers and switches.

- (b) Fire Taping: Provide fire protective tape on all medium-voltage conductors in manholes and in vaults under transformers.
- (c) Labeling: Label all cables by means of fiber, laminated plastic, or nonferrous metal tags indicating the cable type, conductor size, circuit number, circuit voltage, cable destination, and phase identification.
- (d) Testing: Provide hi-pot and phase testing on all new primary conductors prior to energizing the cables.
- 6.9.1.4. Manholes and Vaults: Size manholes to comply with minimum cable bending radius requirements according to the current edition of the National Electrical Safety Code (NESC), except manholes with in-vault junctions shall be 7-feet by 7-feet by 6-feet deep. Install manholes at street intersections to facilitate street crossings, and space manholes to minimize pulling tension on the conductors. Provide vaults under all transformers with the transformer pad servicing as a portion of the lid for the vault.
- (a) Conductor Installation: Secure conductors to insulators on racks on all four walls of vaults, looped and racked a minimum of 360 degrees, and arranged in an approved manner that provides safe and rapid access to personnel during installation and maintenance.
- (b) Vault Penetrations: Properly seal all transformer vault penetrations with waterproof grout to prevent water and moisture from entering the vault.
- (c) Conduits: Start conduits entering the manhole at the lowest level of entry.
- (d) Testing: Provide DC hi-potential, shield continuity and phase rotation testing on all new primary conductors prior to energizing the cables.
- 6.9.1.5. Junction Pedestals: Provide junctions above ground or in manholes. Where four-way junctions are installed in manholes, provide manhole with diamond plate, two-section steel covers to allow for hook-stick operation. Above-ground junction pedestals are required where the number of junctions exceeds four.
- 6.9.1.6. Distribution Switches: Primary distribution switches shall be fused, dead-front, oil-filled, above-ground type. Fuse 200A taps. Install switches above ground on concrete pads.
- 6.9.1.7. Padmount Distribution Transformers: Furnish and install liquid-filled. pad-mounted transformers for the facility in the project. Locate transformers to comply with AT/FP requirements. Based on the electrical load of the facility or facilities to be served, determine the kVA capacity and low-voltage rating of the transformer. Install outdoor, medium-voltage transformers on vaults. For outdoor installation, use mineral oil design. Use high fire point fluids for indoor/vaults.
- (a) Transformer Specifications: Distribution transformers shall be new, loop-feed, mineral oil-insulated, complying with ANSI C57.12.26. Transformers shall be dead-front, equipped with current-limiting bayonet oil-immersed fuses, five primary taps (two-above and two-below nominal), and a load-break switch (or switches) to facilitate opening and closing of either side of the loop, and the ability to de-energize the transformer with the loop remaining energized. Permanently attach high-voltage warning signs to each side of the transformer. Provide copper-faced or stainless steel ground connection pads in the high- and low-voltage compartments, a dial-type thermometer, pressure-relief valve, liquid-level gauge, and drain valve. Provide oil sampling tube on transformers 500kVA and above. Provide removable MOV surge arrestors on the unused side of loop transformers, where applicable, with removable grounds. Where the transformer is used as a feed-through, provide fault indicators. Provide insulated-bushing-type parking stands adjacent to each separable load-break elbow to provide for cable isolation. Provide pad-lock hasps and locks. Coordinate lock style and material with the Public Works Exterior Electrical Shop. Provide bollards for protection in locations vulnerable to vehicular traffic.
- (b) Primary Connections: Primary conductor connections shall be compression type, except provide mechanical connectors at arrestor grounds.
- (c) Distribution Cut-outs: Where the existing overhead primary is tapped for service to a padmount transformer, the distribution fused cut-outs shall be of the load-break, silicone type that meets the following criteria: Open outdoor load-break fused cut-out with Type K fuses conforming to NEMA C37.42 with rated amperes to match system requirements. Install silicone rubber insulators, clamshell terminal connectors, NEMA B bracket, 12 kAIC symmetrical fault-interrupting current rating, with solid cap fuse holder.

- (d) Secondary Connections: Secondary conductor connections shall be compression type. Provide antioxidant compound where required by code. No penetrations are allowed through the transformer casing.
- (e) Transformer Grounding: Provide a buried copper ground ring around each transformer and ground per National Electrical Safety Code (NESC) for a single-point grounded wye distribution system, with secondary neutral ground isolated from equipment ground and the ground strap removed. Below-grade ground connections shall be of the exothermic type. Refer to JBLM Public Works for typical detail.
- (f) Transformer Pad: Transformer shall sit on a concrete pad sized to serve as the lid for the vault below the transformer. Pads for transformers rated 300 KVA and above shall provide access into the vault without removing the transformer. Access into the vault shall be through a double-hinged diamond plate lid. All pads shall extend 6 inches beyond the transformer enclosure.
- 6.9.1.8. 600-volt Distribution: Provide a 600V underground distribution system from the secondary side of all transformers installed for service to buildings within the scope of this project. Cables shall be copper with 90 °C insulation and suitable for use in an underground duct system. All secondary duct banks shall be direct-buried Schedule 40 PVC with a minimum of 3 inches of sand above and below ducts, except under roads or paved areas subject to vehicular traffic, and shall contain at least one spare duct. Encase duct banks under roads or paved areas subject to vehicular traffic in reinforced concrete. Minimum burial depth shall be 30-inches below finished grade. Provide a 6-inch metallic warning tape above secondary ducts at 12-inches below finished grade. Determine the secondary conductor size, duct size and quantity based on the transformer rating and building service requirements, adjusted for voltage drop. Provide galvanized rigid steel (GRS) conduit long-radius elbows and transitions from below to above grade and into buildings, and wrap all GRS conduits below grade to prevent corrosion. Provide compression type-connectors at the transformer secondary and the building service entrance switchboard.

6.9.2. Site Telecommunications

- 6.9.2.1. General: Telecommunications systems consist of the Army-owned telephone system, which provides Army communications, and the Local Area Network (LAN), Qwest Communications for residential and non-Army telephones, and COMCAST cable television. All communications requirements shall be coordinated with the JBLM NEC through the Contracting Officer.
- (a) Coordination with Adjacent Construction Projects: Alert the Contracting Officer if coordination with adjacent construction projects is required by the Communications System Contractor.
- 6.9.2.2. Telecommunications Duct Bank and Manholes
- (a) Coordinate new manhole/ductwork requirements to ensure manhole vault is correctly sized, duct is the correct schedule rating, and is pointed in the right direction.
- (b) Contractor shall have a cabling/manhole coordination meeting with the COE, Contractor, and JBLM NEC Plans Branch prior to setting manholes and cable ductwork.
- 6.9.3. Site Lighting
- 6.9.3.1. General: Provide exterior lighting appropriate for the building function. Provide street lighting (with photoelectric control) on metal poles for any new streets and on streets that are modified as part of this project. Street lighting shall match the type used on the existing streets within the project area.
- (a) Provide exterior parking lot and pedestrian pathway lighting conforming to the applicable criteria Illuminating Engineering Society of North America (IESNA) recommended illumination levels and the Washington State Non-Residential Energy Code. Provide metal poles with pole-mounted, color-corrected, high-intensity discharge luminaries with cut-off feature to minimize light pollution. Site lighting circuits shall be direct-buried Schedule 40 PVC conduits encased in sand, except where subject to vehicular traffic, encase conduit in reinforced concrete. Provide handholes at each lighting pole. Provide site lighting circuits and controls from the adjacent primary facility service. Provide photoelectric control with manual bypass.
- (b) Security lighting for boundaries and controlled areas, when applicable, shall meet minimum illumination as indicated in the Security Engineering Technical Manual (SETM) 853, Volume 2.
- 6.9.4. Site Grounding

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6.9.4.1. General: Site grounding shall consist of a counterpoise grid system composed of copper clad steel ground rods interconnected by stranded bare #1/0 copper wire. Make connections using exothermic welds below grade for connections to electrical panels, communications system grounds, building steel and static ground points. Exposed ground connections shall be removable pressure type. Grounding and bonding shall comply with Article 250, NFPA 70.

6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

- 6.10.1. Power
- 6.10.1.1. General: Provide at least one exterior door on the ground floor to the main electrical room.
- 6.10.1.2. Service Equipment: Provide a service entrance switchboard or main distribution panel in the main electrical room with copper bus, transient voltage surge suppression, fully rated and selectively coordinated with downstream circuit breakers. (Series-rated breakers are not acceptable.)
- (a) Provide a meter in the Service Switchboard that is compatible with the post DDC system. Meter shall measure kilowatt-hour demand averaged over a 15-minute interval, phase voltage, amps, frequency, true power, reactive power, apparent power, and power factor with an accuracy of 1.0 percent minimum. Meter shall include battery backup, on-board data storage for a minimum of 30 days, peak demand recording, time-of-use logging, and remote alarm annunciation for power outage, phase loss, and phase voltage over/under conditions. Provide communications conduit and wiring from the meter to the DDC system in the Mechanical Room with ANSI/CEA-709.1b protocol (LonWorks) output for communications using Standard Network Variable Types (SNVTs) for measured values.
- (b) Provide panelboards with copper bus and bolt-on circuit breakers, fully rated and coordinated between downstream and upstream circuit breakers. Locate panelboards and dry-type transformers in electrical rooms only.

6.10.2. Telecommunications

- 6.10.2.1. General: Provide dedicated space on the telephone back board for Qwest and Comcast. Qwest and Comcast will provide and install their entrance cables and make connections to their equipment. Furnish and install interior cables from cable television outlets and from commercial telephone outlets that may be required for the facilities in this project back to the appropriate demarcation point. Comcast and Qwest will make the connections to their equipment.
- 6.10.2.2. Provide a standard NEC information outlet on the telephone backboard for connection to the Post EMCS. Coordinate the outlet location with the Department of Public Works.
- 6.10.2.3. Field Radio Antenna: Coordinate with contracting officer to determine if a field radio antenna is required by the building occupant. If required, provide a 2-inch raceway from the Duty Office (or location designated by the User) to the exterior of the building with a grounding bushing at the interior and a weather head at the exterior and coax cable for a field radio antenna connection. Coordinate installation requirements with the User.

6.10.3. INTRUSION DETECTION

- 6.10.3.1. General: Design and install a complete, fully tested intrusion detection system, including installation of Government-Furnished Contractor-Installed (GFCI) equipment, all conduits and conductors, drawings, system integration, and all testing.
- 6.10.3.2. The Intrusion Detection System (IDS) is an Integrated Commercial Intrusion Detection System II (SAFENET ICIDS II) manufactured by MDI, Inc., 9725 Datapoint Drive, San Antonio, Texas 78229. IDS equipment and devices (RTU's, PPU, BMS, PIR, etc) shall be GFCI devices. Government-furnished equipment shall be provided to the contractor in factory-delivered unopened shipping boxes. Upon receipt of equipment, the contractor shall be responsible for all warranty issues associated with that equipment. Coordinate system requirements with the Physical Security office.
- 6.10.3.3. The Intrusion Detection System shall use Version 6.2.1.6 SAFENET operating system, with PB2000 processor, firmware revision 1.48, encrypted, and carried over the installation LAN via VLAN23. System

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shall be fully compatible with the existing ICIDS II security system. Battery backup shall be provided for a minimum of six hours for all ICIDS components, to include subcomponents that support the operation and reporting of alarm events.

- 6.10.3.4. Work includes updating input points and graphics at the central monitoring station to provide a turnkey system. Contractor shall coordinate with the Government Construction Representative for access to the central monitoring station.
- 6.10.3.5. To reduce system compatibility problems, the Intrusion Detection System shall be installed by MDI-certified ICIDS II integrator with a minimum of five years of experience installing, integrating, and programming on systems comparable in size to JBLM ICIDS, and with the following clearances and certifications:
- Company TOP SECRET
- SECRET for system administrators, programmers, and supervisors
- CONFIDENTIAL for all others performing work on ICIDS

Provide proof of clearances and certifications to the Directorate of Emergency Services.

- 6.10.3.6. Final Testing and Acceptance: Notify the Contracting Officer, two weeks in advance, to schedule final joint Government/Contractor Performance Verification Test (PVT). Submit contractor performance test results, substantiating that the system meets contract requirements, prior to scheduling the PVT.
- 6.11. HEATING, VENTILATING, AND AIR CONDITIONING
- 6.11.1. The HVAC systems for these facilities shall provide heating, ventilation, and (in some cases) cooling, with a design intended for personnel comfort and cooling of electronic equipment (computer servers, communication equipment, etc.). While select spaces may be air-conditioned as required, whole building air-conditioning is not authorized at JBLM.
- 6.11.2. It is desirable to locate all primary mechanical equipment such as air-handlers, boilers, hot water heaters, pumps, storage tanks, etc., inside of a main mechanical room where possible. It is preferred that mechanical equipment not be installed on the roof and be easily accessible and replaceable without the use of a crane or lift. All equipment shall be of the high-efficiency type.
- 6.11.3. DESIGN CRITERIA: All equipment and controls shall be integrated and communicate with the existing JBLM Tridium Niagara system via LonMark/LonTalk and/or BACnet communication protocols.
- 6.11.4. DESIGN REQUIREMENTS
- 6.11.4.1. Design conditions include the following.
- (a) Outdoor Conditions

(Reference: ASHRAE Puget Sound Chapter "Recommended Outdoor Design Temperatures, Washington State," 2nd Edition)

Winter Dry-Bulb (0.6 percent): 24 °F Summer Dry-Bulb: 82 °F Summer Wet-Bulb: 64 °F

(b) Indoor Conditions

Winter Dry-Bulb: 68 °F

Summer Dry-Bulb: 77 °F (air-conditioned spaces only)

- (c) Ventilate elevator equipment rooms per International Building Code and Washington Administrative Code (WAC) Chapter 296-96 for Washington State.
- 6.11.4.2. Have State of Washington inspect boiler and provide certification documentation to the contracting officer's representative.

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6.11.4.3. Heat and ventilate the buildings without the use of mechanical cooling. Design system for 100 percent outdoor air capability. Communication rooms, SIPR rooms, and Electrical rooms may require cooling. Perform heat load calculations to include all anticipated heat producing equipment located within these spaces. Provide a ventilation system based on manufacturer's recommended data as well as published criteria such as can be found in "ASHRAE Thermal Guidelines for Data Processing Environments". Use mechanical cooling only if heat load calculations indicate that ventilation (outdoor air) alone cannot maintain recommended room temperature. If mechanical cooling is required, provide self-contained or split system air-conditioning units using R-410A refrigerant. Unit should be capable of operating in economizer mode to ventilate the space with outdoor air until the thermostat calls for mechanical cooling. Provide exhaust systems for all toilet rooms, shower rooms, janitor rooms, kitchens, clothes dryers, and electrical and mechanical rooms.

- 6.11.4.4. In the absence of published manufacturer's specifications, provide environmental conditions in accordance with one of the following.
- (a) ANSI T1.304 -1997 Ambient Temperature and Humidity Requirements for Network Equipment in Controlled Environments
- (b) ASHRAE Thermal Guidelines for Data Processing Environments
- (c) Network Equipment Building System (NEBS)
- (d) Telcordia GR-63-CORE
- 6.11.4.5. Exhaust toilet rooms per ASHRAE 62.1 2004
- 6.11.4.6. Cast iron boilers of any type are not allowed.
- 6.11.5. DIRECT DIGITAL CONTROL AND ENERGY MANAGEMENT CONTROL SYSTEM: The direct digital control (DDC) and utilities monitoring and control system (UMCS) requirements in Paragraph 6 take precedence over the DDC and UMCS requirements in Paragraph 5 of this SOW. The UMCS uses a Tridium Niagara AX platform that is designed to provide interoperability using LonMark/LonWorks and BACnet compliant controllers. Provide a building DDC system compatible with and remotely programmable and configurable through a Java Application Control Engine (JACE) Network Area Controller (NAC) and the Public Works Tridium AX system via the existing postwide IT wide area network (WAN) operated by NEC. The JACE Network Area Controllers have been approved by NEC for connection to the WAN/LAN. NEC does not allow routers on their WAN/LAN system. Provide a building control system which integrates with the Tridium system, controls the indoor environment, and manages energy consumption, and schedules preventative maintenance, controls interior lighting, controls exterior lighting, monitors fuel consumption, monitors water usage and hot water temperatures at tank and at hot water heater, discharge outlet and after the mixing valve, monitors electrical consumption, (monitors packaged equipment controls, and monitors equipment alarms). All motors are to be monitored for actual status using current transmitters. Provide a LonWorks or BACnet interface for packaged equipment controllers, when necessary for network communication.
- 6.11.5.1. Provide a central location (usually the mechanical room) for each building's control system to monitor and control each zone setpoint. Also provide one DDC system workstation for each project in at least one of the project buildings. Provide a system with alarms that identifies when system is outside of normal operation from sequence or setpoints. Provide interlock and safety routines that will safeguard and prevent progressive damage to equipment due to monitored failures. Provide a system which is user programmable, has access from remote locations, has multiple layers of secured access to data and program information, and has a graphical user interface accessible through any standard web browser without manufacturer's software. The graphical user interface shall allow for hierarchical graphical navigation between systems, provide graphical representations of systems, provide access to real-time data for systems, and provide the ability to override points in a system, and provide access to all supervisory monitoring and control functions. Each system display shall clearly distinguish between the following point data types and information: real-time data, user-entered data, overridden or operatordisabled points, devices in alarm (unacknowledged), and out-of-range, bad, or missing data. The software shall allow the user to create, modify, and delete displays and graphic symbols. Configure monitoring and control (M&C) software functionality. JBLM Standard graphical pages shall be used for system graphic displays, including overrides, alarm handling, scheduling, tends for critical values needing long-term or permanent monitoring via trends, and demand limiting.

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6.11.5.2. Where exposed to damage, install wiring external to control panels, including low-voltage wiring, in metallic raceways (plenum rated wiring where not exposed to damage). Install wiring without splices between control devices and DDC panels. Install instrumentation grounding as necessary to prevent ground loops, noise, and surges from adversely affecting operation of the system.

- 6.11.5.3. Tag cables and conductor wires at both ends, with the identifier shown on the shop drawings. Identify equipment manufacture's literature stating compatibility with JBLM Tridium system and LonMark/LonWorks or BACnet. Demonstrate system communication by downloading programs and configuring programs to controllers over the network from the workstation. Disconnect the network server communication line from the JACEs. Ensure all the JACEs continue to perform their local functions.
- If natural gas is used, connect gas meter to BAS/DDC/UMCS system for monitoring of gas usage. 6.11.5.4. Connect electric and water meters measuring consumption to the DDC/BAS/UMCS system.
- 6.11.5.5. Provide one workstation desktop computer, monitor, etc. with performance meeting current technology standards and web supervisor workstation software, licensed to JBLM/GSA in the "Owner" section for the project. Provide security workstation cabinet with the following features.
- Locking upper compartment with Plexiglass window providing viewable access to most 20-inch monitors. (a)
- (b) Locking pull-out drawer: Facilitates ergonomic operation of keyboard, mouse, and convenient storage of small supplies; keyboard and supplies can be accessed even while top and bottom compartments are locked.
- Full-size locking bottom doors in front and rear for complete access to equipment and cables; lower compartment features one fixed bottom and one adjustable shelf for desktop or tower style PCs, printer, paper or supplies; louvers in rear provide equipment ventilation.
- Heavy-duty all welded steel top and bottom sections bolt together for easy assembly; Top Level Compartment (internal): 20-3/4" W x 21-1/4" D x 23-1/2" H; Overall Dimensions: 21" W x 22-1/2" D x 59-1/2" H.
- 6.11.5.6. Provide one notebook computer with performance meeting current technology standards and the latest version of the Tridium AX Supervisor and AX Workbench engineering tool software, licensed to JBLM/GSA in the owner section.
- 6.11.5.7. All computers shall have the NEC image installed through DPW IT Department before its DDC software is installed and licensed.
- Room temperature sensors shall have pushbutton occupancy override with duration adjustable in 6.11.5.8. programming. Temperature sensors shall be user adjustable with setpoint and adjustment span limited through programming and front end. Temperature sensors shall have a limited set-point and be adjustable remotely through the BAS/EMCS Both override time frame and lever adjustment range to be adjustable through DDC GUI. Thermostats shall not be line voltage.
- 6.11.5.9. Provide M&C software with Web Supervisor license for additional JACEs.
- Provide M&C software with a license for no less than quantity of points to support systems being controlled and monitored, plus 10 percent more for expansion.
- The software shall be expandable in both number of points and number of clients supported in order to support system expansion.
- Perform a Performance Verification Test (PVT) under 100% Government supervision prior to 6.11.5.10. system acceptance. The PVT shall demonstrate that 100% of the system performs as specified, including but not limited to demonstrating that the system correctly performs the Sequences of Operation.
- 6.11.5.11. Provide a minimum of 16 hours of training that consists of 8 hours of classroom and 8 hours of field training at the project site on the installed BAS/DDC/UMCS. Upon completion of this training, each student, using appropriate documentation, should be able to start the system, operate the system, recover the system after a failure, perform routine maintenance and describe the specific hardware, architecture and operation of the system.

6.12. **ENERGY CONSERVATION**

6.12.1. Inclusion of Renewable Energy Features. The following renewable energy features have been determined lifecycle cost effective, are included in the project budget and shall be provided:

None.

- 6.13. FIRE PROTECTION
- 6.13.1. Fire Alarm and Mass Notification

Mass notification shall be fully functional as part of the Monaco D21 fire system. Use installation approved messages provided by JBLM Directorate of Emergency Services (DES), Physical Security Branch. The system shall also connect to the current head-end equipment (CCU) and made fully functional from the remote site located at the JBLM Emergency Operation Command facility.

- 6.13.2. For dry sprinkler systems, use only beltless and oilless compressors.
- 6.13.2.1. Signage
- 6.13.2.2. Where fire alarm panels are located mechanical/equipment rooms signage shall read "FIRE ALARM" 14" X 3" 2 inch letters with white background and red letters.
- 6.13.2.3. Signage for sprinkler riser "RISER ROOM". Use 14" X 3" 2 inch letters with white background and red letters.
- 6.13.2.4. Signage for fire pump. "FIRE PUMP TEST VALVES". 20" X 15"
- 6.14. SUSTAINABLE DESIGN
- 6.14.1. LEED Rating Tool Version. This project shall be executed using LEED-NC Version 3.
- 6.14.2. The minimum requirement for this project is to achieve LEED Silver level. Each non-exempt facility (building plus sitework) must achieve this level. In addition to any facilities indicated as exempt in paragraph 3, the following facilities are exempt from the minimum LEED achievement requirement: None..
- 6.14.3. Credit Validation: The project is the site work and building(s) portion of a multiple contractor Combined Project. LEED registration, compiling of documentation at LEED OnLine and use of the LEED Letter Templates is required Registration and payment of registration fees will be by the Contractor. Administration/team management of the online project will be by the Contractor per Appendix LEED Requirements for Multiple Contractor Combined Projects. Validation of credits will be accomplished by the Government. LEED certification of the project by the Contractor is not required. The Government may choose to seek LEED certification of the project, in which case the Government will pay certification fees and coordinate with GBCI and the Contractor will furnish audit data as requested at no additional cost.
- 6.14.4. Commissioning: See Appendix M for Owner's Project Requirements document(s).
- 6.14.5. LEED Credits Coordination. The following information is provided relative to Sustainable Sites and other credits.

MR Credit 2 Construction Waste Management.

The Installation does not have an on-post recycling facility available for Contractor's use.

Regional Priority Credits (Version 3 only)

The project zip code is 98433.

See LEED Multiple Contractor Responsibilities Table(s) for additional information.

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6.14.6. LEED Credit Preferences, Guidance and Resources. See Appendix L LEED Project Credit Guidance for supplemental information relating to individual credits.

6.14.7. Multiple Contractor Combined Project. When site work and building(s) are accomplished by separate contractors, it is a Multiple Contractor Combined Project for purposes of LEED scoring and documentation. This project is part of a Multiple Contractor Combined Project that includes site work and building(s) accomplished by separate contractors. See Appendix LEED Requirements for Multiple Contractor Combined Projects and Appendix LEED Multiple Contractor Responsibilities Table(s) for special requirements for this project.

6.14.8. Additional Information

- 6.14.8.1. JBLM Sustainability Philosophy is to apply systematic considerations of environmental impact, energy use, natural resources, economy, and quality of life so the end result is a quality, high-performance building. Priorities in the order listed below provide guidance on the relative importance of sustainable strategies to JBLM as an aid in design decision. However, additional proven sustainable strategies are encouraged.
- (a) The following are Fort Lewis' eight sustainability goals.
- (1) Reduce installation stationary source and non-tactical motor vehicle air emissions 85 percent by 2025.
- (2) Reduce total energy consumption by 30 percent by 2015.
- (3) Sustain all activities on post using renewable energy sources and generate all electricity on post by 2025.
- (4) Create sustainable neighborhoods for a livable community that enhances the Puget Sound region.
- (5) Cycle all material use to achieve zero net waste by 2025.
- (6) Maintain the ability of JBLM to meet its current and future military missions without compromising the integrity of natural and cultural resources, both on the installation and regionally.
- (7) Recover all listed and candidate federal species in the South Puget Sound region.
- (8) Treat all wastewaters to Class A reclaim standards by 2025 to conserve water resources and improve Puget Sound water quality.
- (b) The following priorities support JBLM sustainability goals.
- (1) Energy savings, including architectural strategies, such as building orientation, daylighting, and building envelope efficiencies.
- (2) Water savings/reuse.
- (3) Low-emitting, non-toxic materials.
- (4) Reusable/recyclable building materials (do not use materials that must be disposed of in a landfill when removed from the building).
- (5) Tie in to neighborhood sustainability features (e.g., continuance of bike lanes, neighborhood gray water treatment and reuse system, use of neighborhood heat plants).
- (6) Minimize turf areas/water intensive landscapes; use xeriscaping; use low-impact development strategies for stormwater.
- (7) Provide operable windows and views for all building occupants.
- 6.14.8.2. Energy efficiency incentives and rebates through PSE may be available to the Contractor's. Contact PSE energy management engineer to confirm the available rebates and incentive programs that is suited for the project.

6.15. ENVIRONMENTAL

6.15.1. Emergency Unexploded Ordnance (UXO) Response: Should UXO be encountered during construction activities that are deemed to be a threat to human health or the environment, immediately contact JBLM EOD professionals to conduct an emergency response. Additionally, immediately contact the Contracting Officer if UXO is encountered. Include an evaluation of this scenario and procedures, with contact numbers, in the Health and Safety Plan (HASP) for the fieldwork, per the Washington State Department of Labor and Industries requirements.

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6.15.2. Monitoring wells may be encountered during construction activities. Protect any monitoring wells encountered during construction activities against damage. Repair any monitoring well damaged in any way, at the Contractor's expense. Contact the Contracting Officer if a monitoring well is encountered.

6.15.3. Other environmental issues (i.e., random underground storage tanks, transite piping, random transformer, etc.) may be encountered during construction activities. Contact the Contracting Officer if an environmental issue is encountered.

6.16. PERMITS

6.16.1. The Government has obtained no permits/licenses to this project. The Contractor shall obtain ALL permits/licenses required for this project. Submitpermits to the Contracting Officer and Public Works Environmental Division (ED) to allow time for review and revisions with ultimate submittal at least 10 days before commencing removal activities. Provide amendments to the permits to the Contracting Officer and ED. The Contractor shall be responsible for determining fee basis and paying all filing fees. Upon notice to proceed, immediately begin working required permits, and supporting information required by the Government to process permits. Obtain a dig permit from JBLM DPW. Obtain approval for demolition and disposal plans from DPW. Complete all applications for the Clean Air permit and submit to JBLM ED for review. Once reviewed, incorporate changes and forward application and fee to the appropriate agency. Coordinate with DPW for commissioning and approval of water and sewer systems. A Stormwater Pollution Prevention Plan (SWPP) is required for construction activities that will have a land disturbance of one or more acres (or is part of a common plan of development that will disturb an acre or greater), and has the potential for stormwater discharge to a water of the U.S. The Government must approve the SWPPP prior to land disturbing activities. One SWPPP may be submitted jointly for the project or each operator may submit a separate plan.

All permit applications must indicate the following address as the building and site owner:

JBLM Public Works ATTN: IMNW-PWE Box 339500 (Building 2012) Fort Lewis, WA 98433-9500

6.16.2. Additional Required Project Specific Permits:

Environmental Protection Agency: A construction General Permit shall be obtained through the Environmental Protection Agency (EPA). The SWPPP must be submitted to JBLM DPW Water Program prior to applying for general coverage. Follow the EPA's SWPPP template found at HYPERLINK HYPERLINK "http://cfpub.epa.gov/npdes/stormwater/const.cfm" http://cfpub.epa.gov/npdes/stormwater/const.cfm

6.17. DEMOLITION

- 6.17.1. DISPOSAL OF MATERIALS: Cut material generated from the project may be disposed of on post in designated disposal areas. Dispose of all other materials not designated for on post disposal off post at the contractor's expense. On post disposal areas for the specified materials are as follows.
- (a) Sequalitchew Creek Eco Park and Earthworks. Materials accepted for recycling purposes are concrete, asphalt, brick, concrete block (if not painted with lead-based paint), rock, land clearing/clearing debris, and excess uncontaminated soil.
- (b) Uncontaminated excavated soils are accepted at the following pits subject to availability and direction of JBLM, Sequalitchew, Gray Army Airfield Pit, East Gate Pit, and Lincoln Pitc. Non-hazardous lead-contaminated soil (top 6 inches from designated areas) is accepted at former Landfill 2 subject to availability and direction from Public Works.
- (c) Submit a "Borrow Source Use and Entry Notification Form" to dispose of uncontaminated soils within Fort Lewis at the designated sites and under the direction of PW.
- (d) Coordinate all recycling activities, disposal of materials on JBLM, and obtaining permit forms through Public Works, Ron Norton, Solid Waste and Recycling Program Manager JBLM PW/ENRD, General Dynamics; Phone: (253) 966-6452; Cell: (253) 377-1420; Fax: (253) 967-9937; E-mail: ron.norton1@us.army.mil.

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6.17.2. ABANDONED UTILITIES: Locate and remove any abandoned utilities found onsite that may interfere with the site development or building.

6.18. ADDITIONAL FACILITIES

None.

End of Section 01 10 00

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SECTION 01 32 01.00 10 PROJECT SCHEDULE

1.0	GENERAL
1.1.	REFERENCES
1.2.	QUALIFICATION
2.0	PRODUCTS (NOT APPLICABLE)
3.0	EXECUTION
3.1.	GENERAL REQUIREMENTS
3.2.	BASIS FOR PAYMENT AND COST LOADING
3.3.	PROJECT SCHEDULE DETAILED REQUIREMENTS
3.4.	PROJECT SCHEDULE SUBMISSIONS
3.5.	SUBMISSION REQUIREMENTS
3.6.	PERIODIC SCHEDULE UPDATE MEETINGS
3.7.	REQUESTS FOR TIME EXTENSIONS
3.8.	DIRECTED CHANGES
3.9.	WEEKLY PROGRESS MEETINGS
3.10.	OWNERSHIP OF FLOAT

3.11. TRANSFER OF SCHEDULE DATA INTO RMS/QCS

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1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

• U.S. ARMY CORPS OF ENGINEERS (USACE) ER 1-1-11 (1995) Progress, Schedules, and Network Analysis Systems http://www.usace.army.mil/publications/eng-regs/er1-1-11/entire.pdf

1.2. QUALIFICATIONS

Designate an authorized representative who shall be responsible for the preparation of the schedule and all required updating (statusing) and preparation of reports. The authorized representative shall be experienced in scheduling projects similar in nature to this project and shall be experienced in the use of the scheduling software that meets the requirements of this specification.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

- 3.1.1. Submit a project schedule as specified herein for approval showing the sequence in which the Contractor proposes to perform the work and dates on which the Contractor contemplates starting and completing all schedule activities. The scheduling of the entire project, including the design and construction sequences is required. Contractor management personnel shall actively participate in its development. Designers, subcontractors and suppliers working on the project shall also contribute in developing an accurate project schedule. The schedule must be a forward planning as well as a project monitoring tool. The approved project schedule shall be used to measure the progress of the work and to aid in evaluating requests for excusable time extensions. The schedule shall be cost loaded and activity coded as specified herein. The schedule will provide the basis for all progress payments. If the Contractor fails to submit any schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule
- 3.1.2. Status the schedule on at least a monthly basis, as specified herein. If in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained. See paragraph 3.7.4.
- 3.1.3. Failure of the Contractor to comply with the requirements of the Contracting Officer shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2. BASIS FOR PAYMENT AND COST LOADING

The schedule shall be the basis for determining contract earnings during each update period and therefore the amount of each progress payment. Lack of an approved schedule update or qualified scheduling personnel will result in an inability of the Contracting Officer to evaluate contract earned value for the purposes of payment. Failure of the Contractor to provide all information, as specified herein will result in the disapproval of the preliminary, initial and subsequent schedule updates. In the event schedule revisions are directed by the Contracting Officer and those revisions have not been included in subsequent revisions or updates, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until such revisions to the project schedule have been made. Activity cost loading shall be reasonable as determined by the Contracting Officer. The aggregate value of all activities coded to a contract CLIN as specified herein shall equal the value of the CLIN on the Schedule.

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3.3. PROJECT SCHEDULE DETAILED REQUIREMENTS

The computer software system utilized to produce and update the project schedule shall be capable of meeting all requirements of this specification. Failure of the Contractor to meet the requirements of this specification will result in the disapproval of the schedule. Scheduling software that meets the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER-1-1-11(1995) referenced herein are Primavera Project Planner (P3) by Primavera, and Open Plan by Deltek.

3.3.1. Use of the Critical Path Method

Use the Critical Path Method (CPM) of network calculation to generate the project schedule. Prepare the project schedule using the Precedence Diagram Method (PDM).

3.3.2. Level of Detail Required

Develop the project schedule to an appropriate level of detail. Failure to develop the project schedule to an appropriate level of detail, as determined by the Contracting Officer, will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2.1. Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days. Procurement activities are defined herein.

3.3.2.2. Design and Permit Activities

Include design and permit activities, including necessary conferences and follow-up actions and design package submission activities. Include the design schedule in the project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This shall be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Include review and correction periods associated with each item.

3.3.2.3. Procurement Activities

Include activities associated with the submittal, approval, procurement, fabrication and delivery of long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days. A typical procurement sequence includes the string of activities: submit, approve/review, procure, fabricate, and deliver.

3.3.2.4. Mandatory Tasks

Include and properly schedule the following tasks (See also the Sample Preliminary Submittal Register Input Form):

3.3.2.4.1.	Submission, review and acceptance of design packages, including BIM
3.3.2.4.2.	Submission of mechanical/electrical/information systems layout drawings
3.3.2.4.3.	Submission and approval of O & M manuals
3.3.2.4.4.	Submission and approval of as-built drawings
3.3.2.4.5.	Submission and approval of 1354 data and installed equipment lists
3.3.2.4.6.	Submission and approval of testing and air balance (TAB)
3.3.2.4.7.	Submission of TAB specialist design review report

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- 3.3.2.4.8. Submission and approval of fire protection specialist
- 3.3.2.4.9. Submission and approval of testing and balancing of HVAC plus commissioning plans and data. Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements.
- 3.3.2.4.10. Air and water balancing 3.3.2.4.11. **HVAC** commissioning 3.3.2.4.12. Controls testing plan submission 3.3.2.4.13. Controls testing 3.3.2.4.14. Performance Verification testing 3.3.2.4.15. Other systems testing, if required 3.3.2.4.16. Contractor's pre-final inspection 3.3.2.4.17. Correction of punch list from Contractor's pre-final inspection 3.3.2.4.18. Government's pre-final inspection
- 3.3.2.5. Government Activities. Show Government and other agency activities that could impact progress. These activities include but are not limited to: approvals, design reviews, review conferences, release for construction of design package(s), environmental permit approvals by State regulators, inspections, utility tie-ins, Government Furnished Property/Equipment (GFP) and Notice to Proceed for phasing requirements, if any.

Correction of punch list from Government's pre-final inspection

3.3.2.6. Activity Responsibility Coding (RESP)

Final Inspection

3.3.2.4.19.

3.3.2.4.20.

Assign Responsibility Code for all activities to the Prime Contractor, Subcontractor or Government agency responsible for performing the activity. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements. Code all activities not coded with a Government Responsibility Code to the Prime Contractor or Subcontractor responsible to perform the work. Activities shall not have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE). Unacceptable code values are abbreviations of the names of subcontractors.

3.3.2.7. Activity Work Area Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities shall not have more than one Work Area Code. Not all activities are required to be Work Area coded. A lack of Work Area coding will indicate the activity is not resource or space constrained.

3.3.2.8. Contract Changes/Requests for Equitable Adjustment (REA) Coding (MODF)

Assign Activity code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer, with a Contract Changes/REA Code. Key all Code values to

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the Government's modification numbering system. Any activity or sequence of activities added to the schedule as a result of alleged constructive changes made by the Government may be added to a copy of the current schedule, subject to the approval of the Contracting Officer. Assign Activity codes for these activities with a Contract Changes/REA Code. Key the code values to the Contractor's numbering system. Approval to add these activities does not necessarily mean the Government accepts responsibility and therefore liability for such activities and any associated impacts to the schedule, but rather the Government recognizes such activities are appropriately added to the schedule for the purposes of maintaining a realistic and meaningful schedule. Such activities shall not be Responsibility Coded to the Government unless approved. An activity shall not have more than one Contract Changes/REA Code

3.3.2.9. Contract Line Item (CLIN) Coding (BIDI)

Code all activities to the CLIN on the Contract Line Item Schedule to which the activity belongs. An activity shall not contain more than one CLIN Item Code. CLIN Item code all activities, even when an activity is not cost loaded.

3.3.2.10. Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities, based upon the phase of work in which the activity occurs. Code activities to either a Design Phase or a Construction Phase. Code fast track design and construction phases proposed by the Contractor to allow filtering and organizing the schedule by fast track design and construction packages. If the contract specifies construction phasing with separately defined performance periods, identify a Construction Phase Code to allow filtering and organizing the schedule accordingly. Each activity shall have only one Phase of Work code.

3.3.2.11. Category of Work Coding (CATW)

Assign Category of Work code to all Activities based upon the category of work which the activity belongs. Category of Work Code must include, but is not limited to: Design, Design Submittal, design reviews, review conferences, Construction Submittal, Approvals (if any), Acceptance, Procurement, Fabrication, Delivery, Weather Sensitive Installation, Non-Weather Sensitive Installation, Start Up, Test, and Turnover. Assign a Category of Work code to each activity. Each activity shall have only one Category of Work Code.

3.3.2.12. Definable Features of Work Coding (FOW1, FOW2, FOW3)

Assign a Definable Feature of Work Code to appropriate activities based on the definable feature of work to which the activity belongs. Definable Feature of Work is defined in Specification Section 01 45 04.00 10, Contractor Quality Control. An activity shall not have more than one Definable Feature of Work Code. Not all activities are required to be Definable Feature of Work Coded.

3.3.3. Scheduled Project Completion and Activity Calendars

The schedule interval shall extend from NTP date to the required contract completion date. The contract completion activity (End Project) shall finish based on the required contract duration, as adjusted for any approved contract time extensions. The first scheduled work period shall be the day after NTP is acknowledged by the Contractor. Schedule activities on a calendar to which the activity logically belongs. Activities may be assigned to a 7 day calendar when the contract assigns calendar day durations for the activity such as a Government Acceptance activity. If the Contractor intends to perform physical work less than seven days per week, schedule the associated activities on a calendar with non-work periods identified including weekends and holidays. Assign the Category of Work Code - Weather Sensitive Installation to those activities that are weather sensitive. Original durations must account for anticipated normal adverse weather. The Government will interpret all work periods not identified as non-work periods on each calendar as meaning the Contractor intends to perform work during those periods.

3.3.3.1. Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. Include as the first activity in the project schedule an activity called "Start Project" or "NTP". The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, with a zero day duration.

3.3.3.2. Schedule Constraints and Open Ended Logic

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Constrain completion of the last activity in the schedule by the contract completion date. Schedule calculations shall result in negative float when the calculated early finish date of the last activity is later than the contract completion date. Include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the contract completion date for the project, and with a zero day duration or by using the "project must finish by" date in the scheduling software. The schedule shall have no constrained dates other than those specified in the contract. The use of artificial float constraints such as "zero fee float" or "zero total float" are typically prohibited. There shall only be 2 open ended activities: Start Project (or NTP) with no predecessor logic and End Project with no successor logic.

3.3.3. Early Project Completion

In the event the Preliminary or Initial project schedule calculates an early completion date of the last activity prior to the contract completion date, the Contractor shall identify those activities that it intends to accelerate and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. The last activity shall have a late finish constraint equal to the contract completion date and the schedule will calculate positive float. The Government will not approve an early completion schedule with zero float on the longest path. The Government is under no obligation to accelerate activities for which it is responsible to support a proposed early contract completion.

3.3.4. Interim Completion Dates

Constrain contractually specified interim completion dates to show negative float when the calculated early finish date of the last activity in that phase is later than the specified interim completion date.

3.3.4.1. Start Phase

Include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2. End Phase

Include as the last activity for a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the specified completion date for that phase and a zero day duration.

3.3.4.3. Phase "X" Hammock

Include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" hammock activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5. Default Progress Data Disallowed

Do not automatically update Actual Start and Finish dates with default mechanisms that may be included in the scheduling software. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the AS and AF dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's updated schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Disable program features which calculate one of these parameters from the other.

3.3.6. Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an

updated project schedule. Correct out of sequence progress that continues for more than two update cycles by logic revision, as approved by the Contracting Officer.

3.3.7. Negative Lags and Start to Finish Relationships

Lag durations contained in the project schedule shall not have a negative value. Do not use Start to Finish relationships (SF).

3.3.8. Calculation Mode

Schedule calculations shall retain the logic between predecessors and successors even when the successor activity starts and the predecessor activity has not finished. Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") will not be allowed.

3.3.9. Milestones

Include milestone activities for each significant project event including but not limited to: milestone activities for each fast track design package released for construction; design complete; foundation/substructure construction complete; superstructure construction complete; building dry-in or enclosure complete to allow the initiation of finish activities; permanent power complete; and building systems commissioning complete.

3.4. PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1. Preliminary Project Schedule Submission

Submit the Preliminary Project Schedule, defining the Contractor's planned operations for the first 90 calendar days for approval within 15 calendar days after the NTP is acknowledged. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. Detail it for the first 90 calendar days. It may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as previously specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required Plan and Program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, the planned submissions of all early design packages, permitting activities, design review conference activities and other non-construction activities intended to occur within the first 90 calendar days. Schedule any construction activities planned for the first 90 calendar days after NTP. Constrain planned construction activities by Government acceptance of the associated design package(s) and all other specified Program and Plan approvals. Activity code any activities that are summary in nature after the first 90 calendar days with Responsibility Code (RESP) and Feature of Work code (FOW1, FOW2, FOW3)

3.4.2. Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after NTP. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. The Initial Schedule shall be at a reasonable level of detail as determined by the Contracting Officer. Include detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences; permit submissions and any required Government actions; and long lead procurement activities required prior to design completion. The Initial Project Schedule shall include the entire construction sequence and all fast track construction activities, with as much detail as is known at the time but, as a minimum, shall include all construction start and completion milestone activities, and detailed construction activities through the dry-in milestone, including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities concurrent with the monthly schedule updating process. Constrain construction activities by Government acceptance of associated

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designs. When the design is complete, incorporate into the then approved schedule update all remaining detailed construction activities that are planned to occur after the dry-in milestone.

3.4.3. Design Package Schedule Submission:

With each design package submitted to the Government, submit a frag-net schedule extracted from the then current Preliminary, Initial or Updated schedule which covers the activities associated with that Design Package including construction, procurement and permitting activities.

3.4.4. Periodic Schedule Updates

Based on the result of the meeting specified in PERIODIC SCHEDULE UPDATE MEETINGS, submit periodic schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgment of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made. Update the schedule to include detailed lower WBS activities procurement and construction activities as the design progresses, but not later than the submission of the final, un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission, if such activity is authorized.

3.4.5. Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used. A template SDEF compatible schedule backup file (sdef.prx) is available on the QCS website: www.rmssupport.com. The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per Day
2	RESP	4	Responsible Party (e.g. GC, subcontractor, USACE)
3	AREA	4	Area of Work
4	MODF	6	Modification or REA number
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of Work
7	CATW	1	Category of Work
8	FOW1	10	Feature of Work (used up to 10 characters in length)
9	FOW2	10	Feature of Work (used up to 20 characters in length)
10	FOW3	10	Feature of Work (used up to 30 characters in length)

3.5. SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1. Data CD's

Provide two sets of data CD's containing the project schedule in the backup format. Each CD shall also contain all previous update backup files. File medium shall be CD. Label each CD, indicating the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file names. Each schedule shall have a unique file name as determined by the Contractor.

3.5.2. Narrative Report

Provide a Narrative Report with the Preliminary, Initial, and each Periodic Update of the project schedule, as the basis of the progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths where the total float is less than or equal to 20 work days, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to communicate to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through its analysis. Identify and explain why any activities that, based their calculated late dates, should have either started or finished during the update period but did not.

3.5.3. Approved Changes Verification

Include only those project schedule changes in the schedule submission that have been previously approved by the Contracting Officer. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4. Schedule Reports

The format, filtering, organizing and sorting for each schedule report shall be as directed by the Contracting Officer. Typically reports shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. The following lists typical reports that will be requested. One or all of these reports may be requested for each schedule submission.

3.5.4.1. Activity Report

A list of all activities sorted according to activity number.

3.5.4.2. Logic Report

A list of detailed predecessor and successor activities for every activity in ascending order sorted by activity number.

3.5.4.3. Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.4.4. Earnings Report by CLIN

A compilation of the Contractor's Total Earnings on the project from the NTP to the data date. This report shall reflect the earnings of specific activities based on the agreements made in the schedule update meeting defined herein. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining progress payments. Group activities by CLIN Item number and sort by activity number. This report shall: sum all activities coded to a particular CLIN and provide a CLIN Item percent earned value; and complete and sum CLIN items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

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3.5.5. Network Diagram

The network diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1. Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.5.2. Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3. Critical Path

Clearly show the critical path.

3.5.5.4. Banding

Organize activities as directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5. S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6. PERIODIC SCHEDULE UPDATE MEETINGS

Conduct periodic schedule update meetings for the purposes of reviewing the Contractor's proposed out of sequence corrections, determining causes for delay, correcting logic, maintaining schedule accuracy and determining earned value. Meetings shall occur at least monthly within five days of the proposed schedule data date and after the Contractor has updated the schedule with Government concurrence respecting actual start dates, actual finish dates, remaining durations and percent complete for each activity it intend to status. Match the acutal start and finish dates with the dates exported, as described in paragraph 3.3.5. Provide a computer with the scheduling software loaded and a projector during the meeting which allows all meeting participants to view the proposed schedule update during the meeting. The meeting and resultant approvable schedule update shall be a condition precedent to a formal submission of the update as described in SUBMISSION REQUIREMENTS and to the submission of an invoice for payment. The meeting will be a working interactive exchange which will allow the Government and the Contractor the opportunity review the updated schedule on a real time and interactive basis. The Contractor's authorized scheduling representative will organize, sort, filter and schedule the update as requested by the Government. The meeting will last no longer than 8 hours. A rough draft of the proposed activity logic corrections and narrative report shall be provided to the Government 48 hours in advance of the meeting. The Contractor's Project Manager and Authorized Scheduler shall attend the meeting with the Authorized Representative of the Contracting Officer.

3.6.1. Update Submission Following Progress Meeting

Submit a complete update of the project schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 working days after the periodic schedule update meeting, reflecting only those changes made during the previous update meeting.

3.6.2. Staus of Activities

Update statusing information, including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD) and Percent Complete shall be subject to the approval of the Government prior to the meeting. As a minimum, address the following items on an activity by activity basis during each progress meeting:

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3.6.2.1. Actual Start and Finish Dates

Accurately status the AS and/or AF dates for each activity currently in-progress or completed since the last update. The Government may allow an AF date to be assigned with the percent complete less than 100% to account for the value of work remaining but not restraining successor activities. Only assign AS dates when actual progress occurs on an activity.

3.6.2.2. Remaining Duration

Update the estimated RD for all incomplete activities independent of Percent Complete. Remaining durations may exceed the activity OD or may exceed the activity's prior update RD if the Government considers the current OD or RD to be understated based on current progress, insufficient work crews actually manning the job, unrealistic OD or deficiencies that must be corrected that restrain successor activities.

3.6.2.3. Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be statused 100 percent complete. To allow for proper schedule management, cost load the correction of punch list from Government pre-final inspection activity(ies) not less than 1% of the total contract value, which activity(ies) may be declared 100 percent complete upon completion and correction of all punch list work identified during Government pre-final inspection(s).

3.6.2.4. Logic Changes

Specifically identify and discuss all logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, and other changes that have been made pursuant to contract provisions. The Government will only approve logic revisions for the purpose of keeping the schedule valid in terms of its usefulness in calculating a realistic completion date, correcting erroneous logic ties, and accurately sequencing the work.

3.6.2.5. Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule that does not represent the actual or planned prosecution and progress of the work.

3.7. REQUESTS FOR TIME EXTENSIONS

In the event the Contractor believes it is entitled to an extension of the contract performance period, completion date, or any interim milestone date, furnish the following for a determination by the Contracting Officer: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of excusable delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is a condition precedent to any approvals by the Government. In response to each Request For Proposal issued by the Government, the Contractor shall submit a schedule impact analysis demonstrating whether or not the change contemplated by the Government impacts the critical path.

3.7.1. Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with its request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay, will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

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3.7.2. Submission Requirements

Submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- 3.7.2.1. A list of affected activities, with their associated project schedule activity number.
- 3.7.2.2. A brief explanation of the causes of the change
- 3.7.2.3. An analysis of the overall impact of the changes proposed.
- 3.7.2.4. A sub-network of the affected area

Identify activities impacted in each justification for change by a unique activity code contained in the required data file.

3.7.3. Additional Submission Requirements

The Contracting Officer may request an interim update with revised activities for any requested time extension of over 2 weeks. Provide this disk within 4 days of the Contracting Officer's request.

- 3.7.4. If Progress Falls Behind the Approved Project Schedule
- 3.7.4.1. Should progress fall behind the approved schedule (more than 20 work days of negative float) due to Contractor generated problems, promptly provide a supplemental recovery or completion schedule that illustrates its efforts to regain time to assure a completion by the required contract completion date.
- 3.7.4.2. The supplemental recovery or completion schedule will not replace the original, approved schedule as the official contract schedule. Continue to update the original, approved schedule on at least a monthly basis. In addition, the Contractor and the Contracting Officer will monitor the supplemental recovery or completion schedule on at least a bi-weekly basis to determine its effect on regaining the rate of progress to assure project completion by the contractually required completion date.
- 3.7.4.3. Do not artificially improve progress by simply revising the schedule logic, modifying or adding constraints, or shortening future work activity durations. Resource and manpower load the supplemental recovery schedule or completion schedule with crew size and productivity for each remaining activity, indicating overtime, weekend work, and/or double shifts needed to regain the schedule, in accordance with FAR 52.236.15, without additional cost to the Government. Indicate assumptions made and the basis for any logic, constraint, or duration changes used in the creation of the supplemental recovery or completion schedule in a narrative submitted for the Contracting Officer's approval. Any additional resources or manpower must be evident at the work site. Do not modify the official contract schedule to include these assumptions.
- 3.7.4.4. Failure to perform work and maintain progress in accordance with the supplemental recovery or completion schedule may result in an interim and final unsatisfactory performance rating and/or may result in corrective action by the Contracting Officer in accordance with FAR 52.236-15.

3.8. DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The Contracting Officer will approve proposed revisions to the schedule prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of

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receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9. WEEKLY PROGRESS MEETINGS

- 3.9.1. The Government and the Contractor shall meet weekly (or as otherwise mutually agreed to) between the meetings described in paragraph PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. The then current and approved schedule update shall be used for the purposes of this meeting and for the production and review of reports. The Contractor's Project Manager and the Authorized Representative of the Contracting Officer shall attend. The weekly progress meeting will address the status of RFI's, RFP's and Submittals.
- 3.9.2. Provide a bar chart produced by the scheduling software, organized by Total Float and Sorted by Early Start Date, and a two week "look-ahead" schedule by filtering all schedule activities to show only current ongoing activities and activities schedule to start during the upcoming two weeks, organized by Work Area Code (AREA) and sorted by Early Start Date.
- 3.9.3. The Government and the Contractor shall jointly review the reports. If it appears that activities on the longest path(s) which are currently driving the calculated completion date (driving activities), are not progressing satisfactorily and therefore could jeopardize timely project completion, corrective action must be taken immediately. Corrective action includes but is not limited to: increasing the number of work crews; increasing the number of work shifts; increasing the number of hours worked per shift; and determining if Government responsibility coded activities require Government corrective action.

3.10. OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

3.11. TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Download and upload the schedule data into the Resident Management System (RMS) prior to RMS databases being transferred to the Government and is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and electronic export from QCS of the application for progress payment.

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SECTION 01 33 00 SUBMITTAL PROCEDURES

1	.0	GENERAL
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- 1.1. DEFINITIONS
- 1.2. NOT USED
- 1.3. SUBMITTAL CLASSIFICATION
- 1.4. APPROVED OR CONCURRED WITH SUBMITTALS
- 1.5. DISAPPROVED SUBMITTALS
- 1.6. WITHHOLDING OF PAYMENT
- 1.7. GENERAL
- 1.8. SUBMITTAL REGISTER
- 1.9. SCHEDULING
- 1.10. TRANSMITTAL FORM (ENG FORM 4025)
- 1.11. SUBMITTAL PROCEDURES
- 1.12. CONTROL OF SUBMITTALS
- 1.13. GOVERNMENT APPROVED SUBMITTALS
- 1.14. INFORMATION ONLY SUBMITTALS
- 1.15. STAMPS

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1.0 GENERAL

1.1. DEFINITIONS

1.1.1. Submittal

Contract Clauses "FAR 52.236-5, Material and Workmanship," paragraph (b) and "FAR 52.236-21, Specifications and Drawings for Construction," paragraphs (d), (e), and (f) apply to all "submittals."

1.1.2. Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by SD numbers and titles as follows.

SD-01 Preconstruction Submittals

- Certificates of insurance.
- Surety bonds.
- List of proposed subcontractors.
- List of proposed products.
- Construction Progress Schedule.
- Submittal register.
- Schedule of prices.
- Accident Prevention Plan.
- Work plan.
- Quality control plan.
- Environmental protection plan.

SD-02 Shop Drawings

- Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.
- Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.
- Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

- Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.
- Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

- Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.
- Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.
- Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies that are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

- Calculations, mix designs, analyses or other data pertaining to a part of work.
- Design submittals, design substantiation submittals and extensions of design submittals.

SD-06 Test Reports

• Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must

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have been within three years of date of contract award for the project.)

- Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.
- Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
- Investigation reports.
- Daily checklists.
- Final acceptance test and operational test procedure.

SD-07 Certificates

- Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.
- Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.
- Confined space entry permits.
- Text of posted operating instructions.

SD-08 Manufacturer's Instructions

• Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

- Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- Factory test reports.

SD-10 Operation and Maintenance Data

• Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

SD-11 Closeout Submittals

 Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

1.1.3. Approving Authority

Office authorized to approve submittal.

1.1.4. Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2. NOT USED

1.3. SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1. Designer of Record Approved (DA)

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1.3.1.1. Designer of Record (DOR) approval is required for all extensions of design, critical materials, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings". Provide the Government the number of copies designated hereinafter of all DOR approved submittals, after the DOR has taken appropriate action. The DOR shall ensure that submittals conform to the Solicitation, the Accepted Proposal and the completed design, however see below for those submittals proposing a deviation to the contract or a substitution of a material, system, or piece of equipment that was identified by manufacturer, brand name or model description in the accepted contract proposal.

- 1.3.1.2. The DOR shall ensure that the submittals comply with all applicable Buy American Act and Trade Agreement Act clauses in the contract. The DOR may confer with the Contracting Officer's Representative for advice and interpretation of those clauses, as necessary.
- 1.3.1.3. The Government may, but is not required to, review any or all DOR approved submittals for conformance to the solicitation, accepted proposal and the completed design. Except for submittals designated as deviating from the Solicitation, the Accepted Proposal or completed design, the Contractor may proceed with acquisition and installation upon DOR approval. Government Approved (GA)

1.3.2. Government Approved (GA)

Government approval is required for any item specifically designated as requiring Government approval in the Solicitation, for internal and external color finish selections and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.3.3. Government Conformance Review of Design (CR)

The Government will review all intermediate and final design submittals for conformance with the technical requirements of the solicitation. Section 01 33 16 DESIGN AFTER AWARD covers the design submittal and review process in detail. Review will be only for conformance with the applicable codes, standards and contract requirements. Design data includes the design documents described in Section 01 33 16 **DESIGN AFTER AWARD**. Generally, design submittals should be identified as SD-05 Design Data submittals.

- 1.3.4. Designer of Record Approved/Government Conformance Review (DA/CR)
- 1.3.4.1. Deviations to the Accepted Design. Designer of Record approval and the Government's concurrence are required for any proposed deviation from the accepted design which still complies with the contract (the Solicitation and Accepted Proposal) before the Contractor is authorized to proceed with material acquisition or installation. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings." If necessary to facilitate the project schedule, the Contractor and the DOR may discuss a submittal proposing a deviation with the Contracting Officer's Representative prior to officially submitting it to the Government. However, the Government reserves the right to review the submittal before providing an opinion, if it deems it necessary. In any case, the Government will not formally agree to or provide a preliminary opinion on any deviation without the DOR's approval or recommended approval. The Government reserves the right to non-concur with any deviation from the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and concurred design.
- 1.3.4.2. Substitutions. Unless prohibited or provided for otherwise elsewhere in the Contract, where the accepted contract proposal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, and the Contractor desires to substitute manufacturer or model after award, submit a requested substitution for Government concurrence. Include substantiation, identifying information and the DOR's approval, as meeting the contract requirements and that it is equal in function, performance, quality and salient features to that in the accepted contract proposal.
- 1.3.5. Designer of Record Approved/Government Approved (DA/GA)

Any proposed deviation to the solicitation and/or the accepted proposal constitutes a change to the contract. In addition to the above stated requirements for proposed deviations to the accepted design, both Designer of Record and Government Approval and, where applicable, a contract modification are required before the Contractor is

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authorized to proceed with material acquisition or installation for any proposed deviation to the contract. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings". The Government reserves the right to accept or reject any such proposed deviation at its discretion.

1.3.6. Information Only

All submittals not requiring Designer of Record or Government approval will be for information only. Provide the Government "For Information Only" copies of all submittals not requiring Government approval or concurrence, after the Designer of Record has taken the appropriate action.

1.4. APPROVED OR CONCURRED WITH SUBMITTALS

Do not construe the Contracting Officer's approval of or concurrence with submittals as a complete check, but only that design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Approval or concurrence will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work. The Government won't consider re-submittals for the purpose of substituting previously approved materials or equipment unless accompanied by an explanation of why a substitution is necessary.

1.5. DISAPPROVED SUBMITTALS

Make all corrections required by the Contracting Officer, obtain the Designer of Record's approval when applicable, and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. Resubmit any "information only" submittal found to contain errors or unapproved deviations from the Solicitation or Accepted Proposal as one requiring "approval" action, requiring both Designer of Record and Government approval. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, provide prompt notice in accordance with the Contract Clause "Changes" to the Contracting Officer.

1.6. WITHHOLDING OF PAYMENT

No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.7. GENERAL

Make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, the Contractor's Quality Control (CQC) System Manager and the Designer of Record, if applicable, shall check, approve, sign, and stamp all items, indicating action taken. Clearly idenify proposed deviations from the contract requirements. Include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Schedule and make submittals requiring Government approval prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples remaining upon completion of the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.8. SUBMITTAL REGISTER (GA)

Develop a complete list of submittals, including each separate design package submittal. Submit the initial submittal register within 15 days after Notice to Proceed, including, as a minimum, the design packages and other initial submittals required elsewhere in the contract. The Designer of Record shall identify required submittals in the

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specifications, and use the list to prepare the Submittal Register, utilizing the government-provided software, QCS (see Section 01 45 01.10), to create the ENG Form 4288. Appendix Ris a preliminary submittal register input form for use with the Quality Management System and the Resident Office Management System (QCS and RMS). The Government will provide the Contractor the actual Excel Spreadsheet version of this sample input form after award to modify and to use for input into QCS. The Excel Spreadsheet is not totally inputable into QCS, so additional keystroke input will be necessary. The sample input form is not all-inclusive. In addition, additional submittals may be required by other parts of the contract. After award, the parties will meet to discuss contract specific (or task order specific for a task order contract) distribution for the submittals all-inclusive and additional submittals may be required by other parts of the contract. Develop and complete the submittal register as the design is completed. Submit it to the Contracting Officer with the un-reviewed final design package submission or as soon as the design specifications are completed, if before the final design submission. When applicable, if the Contractor elects to fast track design and construction, using multiple design package submissions, update the submittal register to reflect the submittals associated with each design submission, clearly denoting all revisions to the previous submission. The submittal register serves as a scheduling document for submittals and for control of submittal actions throughout the contract period. Coordinate the submit dates and need dates used in the submittal register with dates in the Contractor prepared progress schedule. Submit montly updates to the submittal register showing the Contractor action codes and actual dates with Government action codes and actual dates or until all submittals have been satisfactorily completed. Revise and submit the submittal register when revising the progress schedule.

1.9. SCHEDULING

Schedule submittals covering component items forming a system or items that are interrelated to be coordinated and submitted concurrently. Schedule certifications to be submitted with the pertinent drawings. Allow adequate time (a minimum of 15 calendar days exclusive of mailing time) and show on the register for those items requiring Government approval or concurrence. No delay damages or time extensions will be allowed for time lost in late submittals by the Contractor.

1.10. TRANSMITTAL FORM (ENG FORM 4025)

Use the transmittal form (ENG Form 4025) for submitting submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor or are included in the QCS software if the Contractor is required to use QCS for this contract. Use a separate transmittal form for each specification section Complete this form by filling out all the heading blank spaces and identify each item submitted. Exercise special care to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.11. SUBMITTAL PROCEDURES

Make submittals as follows:

1.11.1. Procedures

The Government will further discuss detailed submittal procedures with the Contractor at the Post-Award Conference.

1.11.2. Deviations

For submittals which include proposed deviations requested by the Contractor, check the column "variation" of ENG Form 4025. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.12. CONTROL OF SUBMITTALS

Carefully control his procurement operations to ensure that each individual submittal is made on or before the scheduled submittal date shown on the approved "Submittal Register."

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

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Upon completion of review of submittals requiring Government approval or concurrence, the Government will stamp and date the submittals as approved or concurred. The Government will retain three (3) copies of the submittal and return one (1) copy(ies) of the submittal.

1.14. INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. The Government will retain two (2) copies of information only submittals.

1.15. STAMPS

Use stamps similar to the following on the submittal data to certify that the submittal meets contract requirements:

	CONTRACTOR
	(FIRM NAME)
	Approved
	Approved with corrections as noted on submittal data and/or attached sheet(s)
Signature:	
Title:	
Date:	

For design-build construction, both the Contractor Quality Control System Manager and the Designer of Record shall stamp and sign to certify that the submittal meets contract requirements.

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SECTION 01 33 16 DESIGN AFTER AWARD

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ATTACHMENT G DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

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1.0 GENERAL INFORMATION

1.1. INTRODUCTION

- 1.1.1. The information contained in this section applies to the design required after award. After award, the Contractor will develop the accepted proposal into the completed design, as described herein.
- 1.1.2. The Contractor may elect to fast track the design and construction that is, proceed with construction of parts of the sitework and facilities prior to completion of the overall design. To facilitate fast tracking, the Contractor may elect to divide the design into no more than ten (10) design packages per major facility type and no more than three (3) design packages for site and associated work. Designate how it will package the design, consistent with its overall plan for permitting (where applicable) and construction of the project. See Sections 01 33 00 SUBMITTAL PROCEDURES and 01 32 01.00 10 PROJECT SCHEDULE for requirements for identifying and scheduling the design packaging plan in the submittal register and project schedule. See also Sections 01 10 00 STATEMENT OF WORK and 01 57 20.00 10 ENVIRONMENTAL PROTECTION for any specified permit requirements. If early procurement of long-lead item construction materials or installed equipment, prior to completion of the associated design package, is necessary to facilitate the project schedule, also identify those long-lead items and how it will assure design integrity of the associated design package to meet the contract requirements (The Contract consists of the Solicitation requirements and the accepted proposal). Once the Government is satisfied that the long-lead items meet the contract requirements, the Contracting Officer will allow the Contractor to procure the items at its own risk.
- 1.1.3. The Contractor may proceed with the construction work included in a separate design package after the Government has reviewed the final (100%) design submission for that package, review comments have been addressed and resolved to the Government's satisfaction and the Contracting Officer (or the Administrative Contracting Officer) has agreed that the design package may be released for construction.
- 1.1.4. INTEGRATED DESIGN. To the maximum extent permitted for this project, use a collaborative, integrated design process for all stages of project delivery with comprehensive performance goals for siting, energy, water, materials and indoor environmental quality and ensures incorporation of these goals. Consider all stages of the building lifecycle, including deconstruction.

1.2. DESIGNER OF RECORD

Identify, for approval, the Designer of Record ("DOR") that will be responsible for each area of design. One DOR may be responsible for more than one area. Listed, Professional Registered, DOR(s) shall account for all areas of design disciplines shall be accounted for by a listed. The DOR's shall stamp, sign, and date each design drawing and other design deliverables under their responsible discipline at each design submittal stage (see contract clause Registration of Designers). If the deliverables are not ready for release for construction, identify them as "preliminary" or "not for release for construction" or by using some other appropriate designation. The DOR(s) shall also be responsible for maintaining the integrity of the design and for compliance with the contract requirements through construction and documentation of the as-built condition by coordination, review and approval of extensions of design, material, equipment and other construction submittals, review and approval or disapproval of requested deviations to the accepted design or to the contract, coordination with the Government of the above activities, and by performing other typical professional designer responsibilities.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

- 3.1. PRE-WORK ACTIVITIES & CONFERENCES
- 3.1.1. Design Quality Control Plan

Submit for Government acceptance, a Design Quality Control Plan in accordance with Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL before design may proceed.

3.1.2. Post Award Conference

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3.1.2.1. The government will conduct a post award contract administration conference at the project site, as soon as possible after contract award. This will be coordinated with issuance of the contract notice to proceed (NTP). The Contractor and major sub-contractor representatives shall participate. All designers need not attend this first meeting. Government representatives will include COE project delivery team members, facility users, facility command representatives, and installation representatives. The Government will provide an agenda, meeting goals, meeting place, and meeting time to participants prior to the meeting.

- 3.1.2.2. The post award conference shall include determination and introduction of contact persons, their authorities, contract administration requirements, discussion of expected project progress processes, and coordination of subsequent meetings for quality control (see Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL), Partnering (see below and SCR: Partnering), and the initial design conference (see below).
- 3.1.2.3. The government will introduce COE project delivery team members, facility users, facility command representatives, and installation representatives. The DB Contractor shall introduce major subcontractors, and other needed staff. Expectations and duties of each person shall be defined for all participants. A meeting roster shall be developed and distributed by the government with complete contact information including name, office, project role, phone, mailing and physical address, and email address.

3.1.3. Partnering & Project Progress Processes

- 3.1.3.1. The initial Partnering conference may be scheduled and conducted at any time with or following the post award conference. The Government proposes to form a partnership with the DB Contractor to develop a cohesive building team. This partnership will involve the COE project delivery team members, facility users, facility command representatives, installation representatives, Designers of Record, major subcontractors, contractor quality control staff, and contractor construction management staff. This partnership will strive to develop a cooperative management team drawing on the strengths of each team member in an effort to achieve a quality project within budget and on schedule. This partnership will be bilateral in membership and participation will be totally voluntary. All costs, excluding labor and travel expenses, shall be shared equally between the Government and the Contractor. The Contractor and Government shall be responsible for their own labor and travel costs. Normally, partnering meetings will be held at or in the vicinity of the project installation.
- 3.1.3.2. As part of the partnering process, the Government and Contractor shall develop, establish, and agree to comprehensive design development processes including conduct of conferences, expectations of design development at conferences, fast-tracking, design acceptance, Structural Interior Design (SID)/ Furniture, Fixtures & Equipment (FF&E) design approval, project closeout, etc. The government will explain contract requirements and the DB Contractor shall review their proposed project schedule and suggest ways to streamline processes.

3.1.4. Initial Design Conference

The initial design conference may be scheduled and conducted at the project installation any time after the post award conference, although it is recommended that the partnering process be initiated with or before the initial design conference. Any design work conducted after award and prior to this conference should be limited to site and is discouraged for other items. All Designers of Record shall participate in the conference. The purpose of the meeting is to introduce everyone and to make sure any needs the contractor has are assigned and due dates established as well as who will get the information. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning the BIM Implementation Plan demonstration at this meeting. The DB Contractor shall conduct the initial design conference.

3.1.5. **Pre-Construction Conference**

Before starting construction activities, the Contractor and Government will jointly conduct a pre-construction administrative conference to discuss any outstanding requirements and to review local installation requirements for start of construction. It is possible there will be multiple Pre-Construction Conferences based on the content of the design packages selected by the Contractor. The Government will provide minutes of this meeting to all participants.

3.2. STAGES OF DESIGN SUBMITTALS AND OVER THE SHOULDER PROGRESS REVIEWS Section: 01 33 16

The stages of design submittals described below define Government expectations with respect to process and content. The Contractor shall determine how to best plan and execute the design and review process for this project, within the parameters listed below. As a minimum, the Government expects to see at least one interim design submittal, at least one final design submittal before construction of a design package may proceed and at least one Design Complete submittal that documents the accepted design. The Contractor may sub-divide the design into separate packages for each stage of design and may proceed with construction of a package after the Government accepts the final design for that package. See discussion on waivers to submission of one or more intermediate design packages where the parties partner during the design process. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning BIM and the various stages of design submittals and over-the-shoulder progress reviews.

3.2.1. Site/Utilities

To facilitate fast-track design-construction activities the contractor may submit a final (100%) site and utility design as the first design submittal or it may elect to submit interim and final site and utility design submittals as explained below. Following review, resolution, and incorporation of all Government comments, and submittal of a satisfactory set of site/utility design documents, after completing all other pre-construction requirements in this contract and after the pre-construction meeting, the Government will allow the Contractor to proceed with site development activities, including demolition where applicable, within the parameters set forth in the accepted design submittal. For the first site and utility design submission, whether an interim or final, the submittal review, comment, and resolution times from this specification apply, except that the Contractor shall allow the Government a 14 calendar day review period, exclusive of mailing time. No on-site construction activities shall begin prior to written Government clearance to proceed.

3.2.2. Interim Design Submittals

The Contractor may submit either a single interim design for review, representing a complete package with all design disciplines, or split the interim design into smaller, individual design packages as it deems necessary for fast-track construction purposes. As required in Section 01 32 01.00 10 PROJECT SCHEDULE, the Contractor shall schedule its design and construction packaging plan to meet the contract completion period. This submission is the Government's primary opportunity to review the design for conformance to the solicitation and to the accepted contract proposal and to the Building Codes at a point where required revisions may be still made, while minimizing lost design effort to keep the design on track with the contract requirements. The requirements for the interim design review submittals and review conferences are described hereinafter. This is not necessarily a hold point for the design process; the Contractor may designate the interim design submittal(s) as a snapshot and proceed with design development at its own risk. See below for a waiver, where the parties establish an effective over-the-shoulder progress review procedure through the partnering process that would eliminate the need for or expedite a formal intermediate design review on one or more individual design packages.

3.2.3. Over-the-Shoulder Progress Reviews

To facilitate a streamlined design-build process, the Government and the Contractor may agree to one-on-one reviewer or small group reviews, electronically, on-line (if available within the Contractor's standard design practices) or at the Contractor's design offices or other agreed location, when practicable to the parties. The Government and Contractor will coordinate such reviews to minimize or eliminate disruptions to the design process. Any data required for these reviews shall normally be provided in electronic format, rather than in hard copy. If the Government and Contractor establish and implement an effective, mutually agreeable partnering procedure for regular (e.g., weekly) over-the shoulder review procedures that allow the Government reviewers the opportunity to keep fully informed of the progress, contents, design intent, design documentation, etc. of the design package, the Government will agree to waive or to expedite the formal intermediate design review period for that package. The Contractor shall still be required to submit the required intermediate design documentation, however the parties may agree to how that material will be provided, in lieu of a formal consolidated submission of the package. It should be noted that Government funding is extremely limited for non-local travel by design reviewers, so the maximum use of virtual teaming methods must be used. Some possible examples include electronic file sharing, interactive software with on-line or telephonic conferencing, televideo conferencing, etc. The Government must still perform its Code and Contract conformance reviews, so the Contractor is encouraged to partner with the reviewers to find ways to facilitate this process and to facilitate meeting or bettering the design-build schedule. The Contractor shall maintain a fully functional configuration management system as described herein to track design revisions, regardless of whether or not there is a need for a formal intermediate design review. The formal intermediate

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review procedures shall form the contractual basis for the official schedule, in the event that the partnering process determines that the formal intermediate review process to be best suited for efficient project execution. However, the Government pledges to support and promote the partnering process to work with the Contractor to find ways to better the design schedule.

3.2.4. Final Design Submissions

This submittal is required for each design package prior to Government acceptance of that design package for construction. The requirements for the final design submittal review conferences and the Government's acceptance for start of construction are described herein after.

3.2.5. Design Complete Submittals

After the final design submission and review conference for a design package, revise the design package to incorporate the comments generated and resolved in the final review conferences, perform and document a backcheck review and submit the final, design complete documents, which shall represent released for construction documents. The requirements for the design complete submittals are described hereinafter.

3.2.6. Holiday Periods for Government Review or Actions

Do not schedule meetings, Government reviews or responses during the last two weeks of December or other designated Government Holidays (including Friday after Thanksgiving). Exclude such dates and periods from any durations specified herein for Government actions.

3.2.7. Late Submittals and Reviews

If the Contractor cannot meet its scheduled submittal date for a design package, it must revise the proposed submittal date and notify the government in writing, at least one (1) week prior to the submittal, in order to accommodate the Government reviewers' other scheduled activities. If a design submittal is over one (1) day late in accordance with the latest revised design schedule, or if notification of a proposed design schedule change is less than seven (7) days from the anticipated design submission receipt date, the Government review period may be extended up to seven (7) days due to reviewers' schedule conflicts. If the Government is late in meeting its review commitment and the delay increases the Contractor's cost or delays completion of the project, the Suspension of Work and Defaults clauses provide the respective remedy or relief for the delay.

3.3. DESIGN CONFIGURATION MANAGEMENT

3.3.1. Procedures

Develop and maintain effective, acceptable design configuration management (DCM) procedures to control and track all revisions to the design documents after the Interim Design Submission through submission of the As-Built documents. During the design process, this will facilitate and help streamline the design and review schedule. After the final design is accepted, this process provides control of and documents revisions to the accepted design (See Special Contract Requirement: Deviating From the Accepted Design). The system shall include appropriate authorities and concurrences to authorize revisions, including documentation as to why the revision must be made. The DCM data shall be available to the Government reviewers at all times. The Contractor may use its own internal system with interactive Government concurrences, where necessary or may use the Government's "DrChecks Design Review and Checking System" (see below and Attachment C).

3.3.2. Tracking Design Review Comments

Although the Contractor may use its own internal system for overall design configuration management, the Government and the Contractor shall use the DrChecks Design Review and Checking System to initiate, respond to, resolve and track Government design compliance review comments. This system may be useful for other data which needs to be interactive or otherwise available for shared use and retrieval. See Attachment C for details on how to establish an account and set-up the DrChecks system for use on the project.

3.3.3. Design and Code Checklists

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Develop and complete various discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists with each design submittal, as applicable, as part of the project documentation. See Section 01 45 04.00 10 Contractor Quality Control, Attachment D for a Sample Fire Protection and Life Safety Code review checklist and Attachment E for LEED SUBMITTALS.

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1. General

At least one interim design submittal, review and review conference is required for each design package (except that, per paragraph 3.2.1, the Contractor may skip the interim design submission and proceed directly to final design on the sitework and utilities package). The DB Contractor may include additional interim design conferences or over-the-shoulder reviews, as needed, to assure continued government concurrence with the design work. Include the interim submittal review periods and conferences in the project schedule and indicate what part of the design work is at what percentage of completion. The required interim design conferences shall be held when interim design requirements are reached as described below. See also Paragraph: Over-the-Shoulder **Progress Reviews** for a waiver to the formal interim design review.

3.4.2. Procedures

After receipt of an Interim Design submission, allow the Government fourteen (14) calendar days after receipt of the submission to review and comment on the interim design submittal. For smaller design packages, especially those that involve only one or a few separate design disciplines, the parties may agree on a shorter review period or alternative review methods (e.g., over-the-shoulder or electronic file sharing), through the partnering process. For each interim design review submittal, the COR will furnish, to the Contractor, a single consolidated, validated listing of all comments from the various design sections and from other concerned agencies involved in the review process using the DrChecks Design Review and Checking System. The review will be for conformance with the technical requirements of the solicitation and the Contractor's RFP proposal. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that the comment can be resolved. Furnish disposition of all comments, in writing, through DrChecks. The Contractor is cautioned that if it believes the action required by any comment exceeds the requirements of this contract, that it should take no action and notify the COR in writing immediately. The Interim Review conference will be held for each design submittal at the installation. Bring the personnel that developed the design submittal to the review conference. The conference will take place the week after the receipt of the comments by the Contractor. For smaller fast-track packages that involve only a few reviewers, the parties may agree to alternative conferencing methods, such as teleconferencing, or televideo, where available, as determined through Partnering.

3.4.3. Conference Documentation

3.4.3.1. In order to facilitate and accelerate the Government code and contract conformance reviews, identify, track resolution of and maintain all comments and action items generated during the design process and make this available to the designers and reviewers prior to the Interim and subsequent design reviews.

3.4.3.2. The DB Contractor shall prepare meeting minutes and enter final resolution of all comments into DrChecks. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Incorporate valid comments. The Government reserves the right to reject design document submittals if comments are significant. Participants shall determine if any comments are critical enough to require further design development prior to government concurrence. Participants shall also determine how to proceed in order to obtain government concurrence with the design work presented.

3.5. INTERIM DESIGN REQUIREMENTS

Interim design deliverables shall include drawings, specifications, and design analysis for the part of design that the Contractor considers ready for review.

3.5.1. **Drawings**

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Include comments from any previous design conferences incorporated into the documents to provide an interim

3.5.2. Design Analyses

design for the "part" submitted.

- 3.5.2.1. The designers of record shall prepare and present design analyses with calculations necessary to substantiate and support all design documents submitted. Address design substantiation required by the applicable codes and references and pay particular attention to the following listed items:
- 3.5.2.2. For parts including sitework, include site specific civil calculations.
- 3.5.2.3. For parts including structural work, include structural calculations.
- (a) Identify all loads to be used for design.
- (b) Describe the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.
- (c) Provide calculations for all principal roof, floor, and foundation members and bracing and secondary members.
- (d) Provide complete seismic analyses for all building structural, mechanical, electrical, architectural, and building features as dictated by the seismic zone for which the facility is being constructed.
- (e) Computer generated calculations must identify the program name, source, and version. Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings, induced settlements/deflections, etc., and a list of load combinations. Include an output listing for maximum/minimum stresses/forces and deflections for each element and the reactions for each loading case and combination.
- (f) See also the Security (Anti-Terrorism) requirements below for members subject to Anti-Terrorist Force Protection (ATFP) and Progressive Collapse requirements.
- (g) Fully coordinate and integrate the overall structural design between two different or interfacing construction types, such as modular and stick-built or multistory, stacked modular construction. Provide substantiation of structural, consolidation/settlement analysis, etc., as applicable, through the interfaces.
- 3.5.2.4. For Security (Anti-Terrorism): Provide a design narrative and calculations where applicable, demonstrating compliance with each of the 22 standards in UFC 4-010-01, which includes Design of Buildings to Resist Progressive Collapse (use the most recent version of UFC 4-023-03, regardless of references to any specific version in UFC 4-010-01). Where sufficient standoff distance is not being provided, show calculations for blast resistance of the structural system and building envelope. Show complete calculations for members subjected to ATFP loads, e.g., support members of glazed items (jambs, headers, sills) connections of windows to support members and connections of support members to the rest of the structure. For 3 story and higher buildings, provide calculations to demonstrate compliance with progressive collapse requirements.
- 3.5.2.5. For parts including architectural work, include building floor area analysis.
- 3.5.2.6. For parts including mechanical work, include HVAC analysis and calculations. Include complete design calculations for mechanical systems. Include computations for sizing equipment, compressed air systems, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all passive systems and features. Use of hourly energy load computer simulation is required (see paragraph 3.5.5.2 for list of acceptable software). Based on the results of calculations, provide a complete list of the materials and equipment proposed with the manufacturer's published cataloged product installation specifications and roughing-in data.
- 3.5.2.7. For parts including life safety, include building code analysis and sprinkler and other suppression systems. Notwithstanding the requirements of the Codes, address the following:
- (a) A registered fire protection engineer (FPE) must perform all fire protection analyses. Provide the fire protection engineer's qualifications. See Section 01 10 00, paragraph 5 for qualifications.

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(b) Provide all references used in the design including Government design documents and industry standards used to generate the fire protection analysis.

- (c) Provide classification of each building in accordance with fire zone, building floor areas and height and number of stories.
- (d) Provide discussion and description of required fire protection requirements including extinguishing equipment, detection equipment, alarm equipment and water supply. Alarm and detection equipment shall interface to requirements of Electronic Systems.
- (e) Provide hydraulic calculations based on water flow test for each sprinkler system to insure that flow and pressure requirements can be met with current water supply. Include copies of Contractor's water flow testing done to certify the available water source.
- 3.5.2.8. For parts including plumbing systems:
- (a) List all references used in the design.
- (b) Provide justification and brief description of the types of plumbing fixtures, piping materials and equipment proposed for use.
- (c) Detail calculations for systems such as sizing of domestic hot water heater and piping; natural gas piping; LP gas piping and tanks, fuel oil piping and tanks, etc., as applicable.
- (d) When the geotechnical report indicates expansive soils are present, indicate in the first piping design submittal how piping systems will be protected against damage or backfall/backflow due to soil heave (from penetration of slab to the 5 foot building line).
- 3.5.2.9. For elevator systems:
- (a) List all criteria codes, documents and design conditions used.
- (b) List any required permits and registrations for construction of items of special mechanical systems and equipment.
- 3.5.2.10. For parts including electrical work, include lighting calculations to determine maintained foot-candle levels, electrical load analysis and calculations, electrical short circuit and protective device coordination analysis and calculations and arc fault calculations.
- 3.5.2.11. For parts including telecommunications voice/data (including SIPRNET, where applicable), include analysis for determining the number and placement of outlets
- 3.5.2.12. For Cathodic Protection Systems, provide the following stamped report by the licensed corrosion engineer or NACE specialist with the first design submission. The designer must be qualified to engage in the practice of corrosion control of buried or submerged metallic surfaces. He/she must be accredited or certified by the National Association of Corrosion Engineers (NACE) as a NACE Accredited Corrosion Specialist or a NACE certified Cathodic Protection Specialist, or must be a registered professional engineer with a minimum of five years experience in corrosion control and cathodic protection, Clearly describe structures, systems or components in soil or water to be protected. Describe methods proposed for protection of each.
- 3.5.3. Geotechnical Investigations and Reports:
- 3.5.3.1. The contractor's licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal. Make this information available as early as possible during the over-the-shoulder progress review process. Summarize the subsurface conditions and provide recommendations for the design of appropriate utilities, foundations, floor slabs, retaining walls, embankments, and pavements. Include compaction requirements for fill and backfill under buildings, sidewalks, other structures and open areas. Recommend foundation systems to be used, allowable bearing pressures for footings, lateral load resistance capacities for foundation systems, elevations for footings, grade beams, slabs, etc. Provide an assessment of post-construction settlement potential including total and differential. Provide recommendations regarding lateral earth pressures (active, at-rest, passive) to be used in the design of retaining walls. Include the recommended spectral accelerations and Site Class for seismic design along with an evaluation of any seismic hazards and recommendations for mitigation, if required. Include calculations to support the recommended

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design parameters such as Site Class, shear strength, earth pressure coefficients, friction factors, subgrade modulus, California Bearing Ratio (CBR), etc. Provide earthwork recommendations, expected frost penetration, expected groundwater levels, recommendations for dewatering and groundwater control and the possible presence of any surface or subsurface features that may affect the construction of the project such as sinkholes, boulders, shallow rock, old fill, old structures, soft areas, or unusual soil conditions. Include pH tests, salinity tests, resistivity measurements, etc., required to design corrosion control and grounding systems. Include the raw field data. Arrange a meeting with the Government subsequent to completion and evaluation of the site specific geotechnical exploration to outline any differences encountered that are inconsistent with the Government provided preliminary soils information. Clearly outline differences which require changes in the foundation type, or pavement and earthwork requirements from that possible and contemplated using the Government furnished preliminary soils investigation, which result in a change to the design or construction. Any equitable adjustment is subject to the provisions of the contract's Differing Site Conditions Clause.

- 3.5.3.2. Vehicle Pavements: The Contractor's geotechnical report shall contain flexible and rigid pavement designs, as applicable for the project, including design CBR and modulus of subgrade reaction and the required compaction effort for subgrades and pavement layers. Provide Information on the types of base course materials available in the area and design strengths.
- 3.5.3.3. The Contractor and the professional geotechnical engineer consultant shall certify in writing that the design of the project has been developed consistent with the Contractor's final geotechnical report. The certification shall be stamped by the consulting professional geotechnical engineer and shall be submitted with the first design submission. If revisions are made to the initial design submission, a new certification shall be provided with the final design submission.

3.5.4. LEED Documentation:

Assign a LEED Accredited Professional, responsible to track LEED planning, performance and documentation for each LEED credit through construction closeout. Incorporate LEED credits in the plans, specifications and design analyses. Develop LEED supporting documentation as a separable portion of the Design Analysis and provide with each required design submittal. Include the LEED Project checklist for each non-exempt facility (one checklist may be provided for multiple facilities in accordance with the LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects and the LEED SUBMITTALS (Attachment E, herein) with each submittal. Final design submittal for each portion of the work must include all required design documentation relating to that portion of work (example - all site credit design documents with final site design). Submittal requirements are as indicated in Attachment E, LEED SUBMITTALS. Submit all documentation indicated on Attachment E as due at final design at final design submittal (for fast-track projects with multiple final design submittals, this shall be at the last scheduled final design submittal). All project documentation related to LEED shall conform to USGBC requirements for both content and format, including audit requirements and be separate from other design analyses. Maintain and update the LEED documentation throughout project progress to construction closeout and shall compile product data, receipts, calculations and other data necessary to substantiate and support all credits claimed. The Government may audit any or all individual credits. Audit documentation is not required to be submitted unless requested. These requirements apply to all projects. If the project requires the Contractor to obtain USGBC certification, the Contractor shall also be responsible for obtaining USGBC certification and shall provide written evidence of certification with the construction closeout LEED documentation submittal. Install the USGBC building plaque at the location indicated by the Government upon receipt. If Contractor obtains USGBC interim design review, submit the USGBC review to the Government within 30 days of receipt for information only.

3.5.4.1. LEED Documentation for Technology Solution Set. If the Solicitation provides a Prescriptive Technology Solution Set, use of the Technology Solution set has no effect on LEED documentation requirements. Provide all required LEED documentation, including energy analysis, in accordance with LEED requirements when using the Technology Solution Set.

3.5.5. Energy Conservation:

3.5.5.1. Refer to Section 01 10 00, Paragraph 5. Interim and Final Design submittals shall demonstrate that each building including the building envelope, HVAC systems, service water heating, power, and lighting systems meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Use Compliance Documentation forms available from ASHRAE and included in the ASHRAE 90.1 User's Manual for this purpose. The Architectural Section of the Design Analysis shall include completed forms titled "Building Envelope"

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Compliance Documentation Parts I and II". The Heating Ventilating and Air Conditioning (HVAC) Section of the Design Analysis shall include a completed form titled "HVAC Simplified Approach Option - Part I" if this approach is allowed by the Standard. Otherwise, the HVAC Section of the Design Analysis shall include completed forms titled "HVAC Mandatory Provisions - Part II" and "HVAC Prescriptive Requirements - Part III". The Plumbing Section of the Design Analysis shall include a completed form titled "Service Water Heating Compliance Documentation". The Electrical Section of the Design Analysis shall include an explanatory statement on how the requirements of ASHRAE 90.1-2004 Chapter 8 Power were met. The Electrical Section of the Design Analysis shall also include a completed form titled "Lighting Compliance Documentation".

3.5.5.2. Interim and Final Design submittals which address energy consuming systems, (heating, cooling, service hot water, lighting, power, etc.) must also include calculations in a separate Energy Conservation Section of the Design Analysis which demonstrate and document (a) the baseline energy consumption for the facility or facilities under contract, that would meet the requirements of ANSI/ASHRAE/IESNA Standard 90.1 and (b) the energy consumption of the facility or facilities under contract utilizing the materials and methods required by this construction contract. Use the USGBC Energy and Atmosphere (EA) Credit 1 compliance template / form or an equivalently detailed form for documenting compliance with the energy reduction requirements. This template / form is titled PERFORMANCE RATING METHOD and is available when the project is registered for LEED. The calculation methodology used for this documentation and analysis shall follow the guidelines set forth in Appendix G of ASHRAE 90.1, with two exceptions: a) receptacle and process loads may be omitted from the calculation; and b) the definition of the terms in the formula for Percentage Improvement found in paragraph G1.2 are modified as follows: Baseline Building Performance shall mean the annual energy consumption calculated for a building design intended for use as a baseline for rating above standard design meeting the minimum requirements of the energy standard, and Proposed Building Performance shall mean annual energy consumption calculated for the proposed building design intended for construction. This calculation shall address all energy consuming systems in a single integrated methodology. Include laboratory fume hoods and kitchen ventilation loads in the energy calculation. They are not considered process loads. Individual calculations for heating, cooling, power, lighting, power, etc. systems will not be acceptable. The following building simulation software is acceptable for use in calculating building energy consumption: Hourly Analysis Program (HAP) by Carrier Corp., TRACE 700 by Trane Corp., DOE-2 by US Department of Energy, EnergyPlus by DOD/DOE.

3.5.6. Specifications

Specifications may be any one of the major, well known master guide specification sources (use only one source) such as MASTERSPEC from the American Institute of Architects, SPECTEXT from Construction Specification Institute or Unified Facility Guide Specifications (UFGS using MASTERFORMAT 2004 numbering system), etc. (including specifications from these sources). Manufacturers' product specifications, utilizing CSI's Manu-Spec, three part format may be used in conjunction with the selected specifications. The designers of record shall edit and expand the appropriate Specifications to insure that all project design requirements, current code requirements, and regulatory requirements are met. Specifications shall clearly identify, where appropriate, specific products chosen to meet the contract requirements (i.e., manufacturers' brand names and model numbers or similar product information).

3.5.7. Building Rendering

Present and provide a draft color computer, artist, or hand drawn rendering with the conceptual design submittal of the building exterior. Perspective renderings shall include a slightly overhead view of the entire building to encompass elevations and the roof configuration of the building. After Government review and acceptance, provide a final rendering, including the following:

Three (3) 18" x 24" color prints, framed and matted behind glass with project title underneath the print.

One (1) Image file (high resolution) in JPG format on CD for those in the submittal distribution list.

3.5.8. Interim Building Design Contents

The following list represents what the Government considers should be included in the overall completed design for a facility or project. It is not intended to limit the contractor from providing different or additional information as needed to support the design presented, including the require design analyses discussed above. As the Contractor develops individual design packages and submits them for Interim review, include as much of the applicable

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information for an individual design package as is developed at the Interim design level for review purposes. These pieces shall be developed as the design progresses toward the design complete stage.

3.5.8.1. Lawn and Landscaping Irrigation System

3.5.8.2. Landscape, Planting and Turfing

3.5.8.3. Architectural

- (a) Design Narrative
- (b) Architectural Floor Plans, Typical Wall and Roof Sections, Elevations
- (c) Finish schedule
- (d) All required equipment
- (e) Special graphics requirements
- (f) Door and Window Schedules
- (g) Hardware sets using BHMA designations
- (h) Composite floor plan showing all pre-wired workstations
- (i) Structural Interior Design (SID) package: See ATTACHMENT A for specific requirements
- (j) Furniture, Fixtures & Equipment (FF&E) design package: See ATTACHMENT B for specific requirements

3.5.8.4. Structural Systems. Include:

- (a) Drawings showing principal members for roof and floor framing plans as applicable
- (b) Foundation plan showing main foundation elements where applicable
- (c) Typical sections for roof, floor, and foundation conditions

3.5.8.5. Plumbing Systems

- (a) Show locations and general arrangement of plumbing fixtures and major equipment
- (b) Plan and isometric riser diagrams of all areas including hot water, cold water, waste and vent piping. Include natural gas (and meter as required), (natural gas and meter as required), (LP gas), (fuel oil) and other specialty systems as applicable.
- (c) Include equipment and fixture connection schedules with descriptions, capacities, locations, connection sizes and other information as required

3.5.8.6. HVAC Systems

- (a) Mechanical Floor Plans: The floor plans shall show all principle architectural features of the building which will affect the mechanical design. The floor plans shall also show the following:
- (1) Room designations.
- (2) Mechanical legend and applicable notes.
- (3) Location and size of all ductwork and piping.
- (4) Location and capacity of all terminal units (i.e., registers, diffusers, grilles, hydronic baseboards).
- (5) Pre-Fabricated Paint Spray Booth (where applicable to project scope)
- (6) Paint Preparation Area (where applicable to project scope)
- (7) Exhaust fans and specialized exhaust systems.
- (8) Thermostat location.
- (9) Location of heating/cooling plant (i.e., boiler, chiller, cooling tower, etc).
- (10) Location of all air handling equipment.

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- (11) Air balancing information.
- (12) Flue size and location.
- (13) Piping diagram for forced hot water system (if used).
- (b) Equipment Schedule: Provide complete equipment schedules. Include:
- (1) Capacity
- (2) Electrical characteristics
- (3) Efficiency (if applicable)
- (4) Manufacturer's name
- (5) Optional features to be provided
- (6) Physical size
- (7) Minimum maintenance clearances
- (a) Details: Provide construction details, sections, elevations, etc., only where required for clarification of methods and materials of design.
- (b) HVAC Controls: Submit complete HVAC controls equipment schedules, sequences of operation, wiring and logic diagrams, Input/Output Tables, equipment schedules, and all associated information. See the Statement of Work for additional specific requirements.
- 3.5.8.7. Fire Protection and Life Safety.
- (a) Provide plan for each floor of each building that presents a compendium of the total fire protection features being incorporated into the design. Include the following types of information:
- (1) The location and rating of any fire-resistive construction such as occupancy separations, area separations, exterior walls, shaft enclosures, corridors, stair enclosures, exit passageways, etc.
- (2) The location and coverage of any fire detection systems
- (3) The location and coverage of any fire suppression systems (sprinkler risers, standpipes, etc.)
- (4) The location of any other major fire protection equipment
- (5) Indicate any hazardous areas and their classification
- (6) Schedule describing the internal systems with the following information: fire hazard and occupancy classifications, building construction type, GPM/square foot sprinkler density, area of operation and other as required
- (b) Working plans and all other materials submitted shall meet NFPA 13 requirements, with respect to required minimum level of detail.
- 3.5.8.8. Elevators. Provide:
- (a) Description of the proposed control system
- (b) Description, approximate capacity and location of any special mechanical equipment for elevators.
- 3.5.8.9. Electrical Systems.
- (a) Electrical Floor Plan(s): Show all principle architectural features of the building which will affect the electrical design. Show the following:
- (1) Room designations.
- (2) Electrical legend and applicable notes.
- (3) Lighting fixtures, properly identified.
- (4) Switches for control of lighting.
- (5) Receptacles.

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- (6) Location and designation of panelboards. Clearly indicate type of mounting required (flush or surface) and reflect accordingly in specifications.
- (7) Service entrance (conduit and main disconnect).
- (8) Location, designation and rating of motors and/or equipment which requires electrical service. Show method of termination and/or connection to motors and/or equipment. Show necessary junction boxes, disconnects, controllers (approximate only), conduit stubs, and receptacles required to serve the motor and/or equipment.
- (b) Building Riser Diagram(s) (from pad-mounted transformer to unit load center panelboard): Indicate the types and sizes of electrical equipment and wiring. Include grounding and metering requirements.
- (c) Load Center Panelboard Schedule(s): Indicate the following information:
- (1) Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Rating and Mounting.
- (2) Branch Circuit Designations.
- (3) Load Designations.
- (4) Circuit Breaker Characteristics. (Number of Poles, Trip Rating, AIC Rating)
- (5) Branch Circuit Connected Loads (AMPS).
- (6) Special Features
- (d) Lighting Fixture Schedule(s): Indicate the following information:
- (1) Fixture Designation.
- (2) General Fixture Description.
- (3) Number and Type of Lamp(s).
- (4) Type of Mounting.
- (5) Special Features.
- (e) Details: Provide construction details, sections, elevations, etc. only where required for clarification of methods and materials of design.
- 3.5.8.10. Electronic Systems including the following responsibilities:
- (a) Fire Detection and Alarm System. Design shall include layout drawings for all devices and a riser diagram showing the control panel, annunciator panel, all zones, radio transmitter and interfaces to other systems (HVAC, sprinkler, etc.)
- (b) Fire Suppression System Control. Specify all components of the Fire Suppression (FS) System in the FS section of the specifications. Clearly describe how the system will operate and interact with other systems such as the fire alarm system. Include a riser diagram on the drawings showing principal components and interconnections with other systems. Include FS system components on drawing legend. Designate all components shown on floor plans "FS system components" (as opposed to "Fire Alarm components"). Show location of FS control panels, HVAC control devices, sensors, and 120V power panel connections on floor plans. Indicate zoning of areas by numbers (1, 2, 3) and detectors sub-zoned for cross zoning by letter designations (A and B). Differentiate between ceiling mounted and under floor detectors with distinct symbols and indicate sub-zone of each.
- (c) Public Address System
- (d) Special Grounding Systems. Completely reflect all design requirements in the specifications and drawings. Specifications shall require field tests (in the construction phase), witnessed by the Government, to determine the effectiveness of the grounding system. Include drawings showing existing construction, if any.
- (e) Cathodic Protection.
- (f) Intrusion Detection, Card Access System
- (g) Central Control and Monitoring System
- (h) Mass Notification System
- (i) Electrical Power Distribution Systems

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Separate detailed Telecommunications drawings for Information Systems including the following

- (a) Telecommunications Cabling
- (b) Supporting Infrastructure

3.5.8.11.

responsibilities:

- (a) Outside Plant (OSP) Cabling Campus or Site Plans Exterior Pathways and Inter-Building Backbones
- (a) Include a layout of the voice/data outlets (including voice only wall & pay phones) on telecommunication floor plan drawing, location of SIPRNET data outlets (where applicable), and a legend and symbol definition to indicate height above finished floor. Show size of conduit and cable type and size on Riser Diagram. Do not show conduit runs between backboard and outlets on the floor plans. Show underground distribution conduit and cable with sizing from point of presence to entrance facility of building.
- (b) Layout of complete building per floor Serving Zone Boundaries, Backbone Systems, and Horizontal Pathways including Serving Zones Drawings Drop Locations and Cable ID's
- (c) Communication Equipment Rooms Plan Views Tech and AMEP/Elevations Racks and Walls. Elevations with a detailed look at all telecomm rooms. Indicate technology layout (racks, ladder-racks, etc.), mechanical/electrical layout, rack elevation and backboard elevation. They may also be an enlargement of a congested area of T1 or T2 series drawing.

3.6. FINAL DESIGN REVIEWS AND CONFERENCES

A final design review and review conference will be held upon completion of final design at the project installation, or – where equipment is available - by video teleconference or a combination thereof, for any design package to receive Government acceptance to allow release of the design package for construction. For smaller separate design packages, the parties may agree on alternative reviews and conferences (e.g., conference calls and electronic file sharing, etc.) through the Partnering process. Include the final design conference in the project schedule and shall indicate what part of the design work is at 100% completion. The final design conference will be held after the Government has had seven (7) calendar days after receipt of the submission to review the final design package and supporting data. For smaller packages, especially those involving only one or a few design disciplines the parties may agree on a shorter period.

3.7. FINAL DESIGN REQUIREMENTS

Final design deliverables for a design package shall consist of 100% complete drawings, specifications, submittal register and design analyses for Government review and acceptance. The 100% design submission shall consist of drawings, specifications, updated design analyses and any permits required by the contract for each package submitted. In order to expedite the final design review, prior to the conference, ensure that the design configuration management data and all review comment resolutions are up-to-date. Include the 100% SID and 100% FF&E binders for government approval. The Contractor shall have performed independent technical reviews (ITR's) and back-checks of previous comment resolutions, as required by Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL, including providing documentation thereof. Use DrChecks or other acceptable comment tracking system during the ITR and submit the results with each final design package

3.7.1. Drawings

- 3.7.1.1. Submit drawings complete with all contract requirements incorporated into the documents to provide a 100% design for each package submitted.
- 3.7.1.2. Prepare all drawings with the Computer-Aided Design and Drafting (CADD)/Computer-Aided Design (CAD) system, organized and easily referenced electronically, presenting complete construction information.
- 3.7.1.3. Drawings shall be complete. The Contractor is encouraged to utilize graphics, views, notes, and details which make the drawings easier to review or to construct but is also encouraged to keep such materials to those that are necessary.
- 3.7.1.4. Provide detail drawings that illustrate conformance with the contract. Include room finish schedules, corresponding color/finish/special items schedules, and exterior finish schedules that agree with the submitted SID binders.

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- 3.7.1.5. The design documents shall be in compliance with the latest version of the A/E/C CADD Standard, available at https://cadbim.usace.army.mil/CAD. Use the approved vertical Corps of Engineers title blocks and borders on all drawings with the appropriate firm name included within the title block area.
- 3.7.1.6. CAD System and Building Information Modeling (BIM) (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order.)
- All CAD files shall be fully compatible with MicroStation V8 or higher. Save all design CAD files as MicroStation V8 or higher files. All submitted BIM Models and associated Facility Data shall be fully compatible with Bentley BIM file format and the USACE Bentley BIM v8 Workspace.
- (a) CAD Data Final File Format: During the design development capture geo-referenced coordinates of all changes made to the existing site (facility footprint, utility line installations and alterations, roads, parking areas, etc) as a result of this contract. There is no mandatory methodology for how the geo-referenced coordinates will be captured, however, Engineering and Construction Bulletin No. 2006-15, Subject: Standardizing Computer Aided Design (CAD) and Geographic Information Systems (GIS) Deliverables for all Military Design and Construction Projects identifies the format for final as-built drawings and data sets to be delivered to the government. Close-out requirements at the as-built stage; require final geo-referenced GIS Database of the new facility along with all exterior modifications. The Government will incorporate this data set into the Installation's GIS Masterplan or Enterprise GIS System. See also, Section 01 78 02.00 10 Closeout Submittals.
- (b) Electronic Drawing Files: In addition to the native CAD design files, provide separate electronic drawing files (in editable CAD format and Adobe Acrobat PDF version 7.0 or higher) for each project drawing.
- (c) Each file (both CAD and PDF) shall represent one complete drawing from the drawing set, including the date, submittal phase, and border. Each drawing file shall be completely independent of any data in any other file, including fonts and shapes not included with the basic CAD software program utilized. Drawing files with external references or special fonts are not acceptable. All displayed graphic elements on all levels of the drawing files shall be part of the project drawing image. The drawing files shall not contain any graphic element that is not part of the drawing image.
- (d) Deliver BIM Model and associated Facility Data files in their native format. At a minimum, BIM files shall address major architecture design elements, major structural components, mechanical systems and electrical/communication distribution and elements as defined in Attachment F. See Attachment F for additional BIM requirements.
- (e) Drawing Index: Provide an index of drawings sheet in CAD as part of the drawing set, and an electronic list in Microsoft Excel of all drawings on the CD. Include the electronic file name, the sheet reference number, the sheet number, and the sheet title, containing the data for each drawing.
- (f) Hard Copies: Plot submitted hard copy drawings directly from the "electronic drawing files" and copy for quantities and sizes indicated in the distribution list at the end of this specification section. The Designers of Record shall stamp, sign and date original hard copy sheets as Released For Construction, and provide copies for distribution from this set.

3.7.2. Design Analyses

- 3.7.2.1. The designers of record shall update, finalize and present design analyses with calculations necessary to substantiate and support all design documents submitted.
- 3.7.2.2. The responsible DOR shall stamp, sign and date the design analysis. Identify the software used where, applicable (name, version, vendor). Generally, provide design analyses, individually, in an original (file copy) and one copy for the assigned government reviewer.
- 3.7.2.3. All disciplines review the LEED design analysis in conjunction with their discipline-specific design analysis; include a copy of the separable LEED design analysis in all design analysis submittals.
- 3.7.2.4. Do not combine multi-disciplined volumes of design-analysis, unless multiple copies are provided to facilitate multiple reviewers (one copy per each separate design analysis included in a volume).

3.7.3. Specifications

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Specifications shall be 100% complete and in final form.

3.7.4. Submittal Register

Prepare and update the Submittal Register and submit it with the 100% design specifications (see Specification Section 01 33 00, SUBMITTAL PROCEDURES) with each design package. Include the required submittals for each specification section in a design package in the submittal register.

3.7.5. Preparation of DD Form 1354 (Transfer of Real Property)

This form itemizes the types, quantities and costs of various equipment and systems that comprise the project, for the purpose of transferring the new construction project from the Corps Construction Division to the Installation's inventory of real property. The Government will furnish the DB Contractor's design manager a DD Form 1354 checklist to use to produce a draft Form 1354. Submit the completed checklist and prepared draft Form DD 1354 with the 100% design in the Design Analysis. The Corps will use these documents to complete the final DD 1354 upon completion of construction.

3.7.6. Acceptance and Release for Construction

3.7.6.1. At the conclusion of the Final Design Review (after resolutions to the comments have been agreed upon between DOR and Government reviewers), the Contracting Officer or the ACO will accept the Final Design Submission for the design package in writing and allow construction to start for that design package. The Government may withhold acceptance until all major corrections have been made or if the final design submission requires so many corrections, even though minor, that it isn't considered acceptably complete.

3.7.6.2. Government review and acceptance of design submittals is for contract conformance only and shall not relieve the Contractor from responsibility to fully adhere to the requirements of the contract, including the Contractor's accepted contract proposal, or limit the Contractor's responsibility of design as prescribed under Special Contract Requirement: "Responsibility of the Contractor for Design" or limit the Government's rights under the terms of the contract. The Government reserves the right to rescind inadvertent acceptance of design submittals containing contract deviations not separately and expressly identified in the submittal for Government consideration and approval.

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

After the Final Design Submission and Review Conference and after Government acceptance of the Final Design submission, revise the design documents for the design package to incorporate the comments generated and resolved in the final review conference, perform and document a back-check review and submit the final, design complete documents. Label the final design complete documents "FOR CONSTRUCTION" or use similar language. In addition to the final drawings and specifications, the following deliverables are required for distribution and field use. The deliverable includes all documentation and supporting design analysis in final form, as well as the final review comments, disposition and the back-check. As part of the quality assurance process, the Government may perform a back-check of the released for construction documentation. Promptly correct any errors or omissions found during the Government back-check. The Government may withhold retainage from progress payments for work or materials associated with a final design package until this submittal has been received and the Government determines that it is complete.

3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES

3.9.1. Submittal Distribution and Quantities

General: The documents which the Contractor shall submit to the Government for each submittal are listed and generally described in preceding paragraphs in this Section. Provide copies of each design submittal and design substantiation as follows (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order):

Activity and Address	Drawing Size (Full Size) 22x34 Full Sets/ *Partial Sets	Design Analyses & Specs Full Sets/ *Partial Sets	Drawing Size (Half Size) 11x17 Full Sets/ *Partial Sets	Non-BIM Data CD-ROM or DVD as Necessary (PDF& .dgn)	Furniture Submittal (Per Attachment B)	Structural Interior Design Submittal	BIM Data DVD (Per Attach F)
Commander, U.S.Army Engineer District Seattle District	1/1	1/1	1/1	6	1	2	2
Commander, U.S.Army Engineer District, Center of Standardization Fort Worth District	1/0	1/1	2/2	6	N/A	2	1
Installation	4/0	4/2	4/2	4	2	4	2
U.S.Army Corps of Engineers Construction Area Office	3/2	3/2	3/2	3	1	3	1
Information Systems Engineering Command (ISEC)	0/0	0/0	0/0	1	N/A	N/A	1
Other Offices	0/0	0/0	0/0	0	N/A	0	0

^{*}NOTE: For partial sets of drawings, specifications and design analyses, see paragraph 3.9.3.3, below.

3.9.2. Web based Design Submittals

Except for full or half-sized drawings for Installation personnel, as designated in the Table above, Web based design submittals will be acceptable as an alternative to the paper copies listed in the Table above, provided a single hard-copy PDF based record set is provided to the Contracting Officer for record purposes. Where the contract requires the Contractor to submit documents to permitting authorities, still provide those authorities paper copies (or in an alternate format where required by the authority). Web based design submittal information shall be provided with adequate security and availability to allow unlimited access those specifically authorized to Government reviewers while preventing unauthorized access or modification. File sizes must be of manageable size for reviewers to quickly download or open on their computers. As a minimum, drawings shall be full scale on American National Standards Institute (ANSI) D sheets (34" x 22"). In addition to the optional website, provide the BIM data submission on DVD to each activity and address noted above in paragraph 3.9.1 for each BIM submission required in Attachment F.

3.9.3. Mailing of Design Submittals

^{**}NOTE: When specified below in 3.9.2, furnish Installation copies of Drawings as paper copies, in lieu of the option to provide secure web-based submittals.

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3.9.3.1. Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract (or individual task order if this is an indefinite delivery/indefinite quantity, task order contract). Mail the submittals to five (5) different addresses. Assemble drawing sheets, specs, design analyses, etc. into individual sets; do not combine duplicate pages from individual sets so that the government has to assemble a set.

- 3.9.3.2. Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.
- 3.9.3.3. Provide partial sets of drawings, specifications, design analyses, etc., as designated in the Table in paragraph 3.9.1, to those reviewers who only need to review their applicable portions of the design, such as the various utilities. The details of which office receives what portion of the design documentation will be worked out after award.

3.10. AS-BUILT DOCUMENTS

Provide as-built drawings and specifications in accordance with Section 01 78 02.00 10, CLOSEOUT SUBMITTALS. Update LEED design phase documentation during construction as needed to reflect construction changes and advancing project completion status (example - Commissioning Plan updates during construction phase) and include updated LEED documentation in construction closeout submittal.

ATTACHMENT A STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

1.0 GENERAL INFORMATION

Structural Interior Design includes all building related elements and components generally part of the building itself, such as wall finishes, ceilings finishes, floor coverings, marker/bulletin boards, blinds, signage and built in casework. Develop the SID in conjunction with the furniture footprint.

2.0 STRUCURAL INTERIOR DESIGN (SID) REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

2.1. FORMAT AND SCHEDULE

Prepare and submit for approval an interior and exterior building finishes scheme for an interim design submittal. The DOR shall meet with and discuss the finish schemes with the appropriate Government officials prior to preparation of the schemes to be presented. Present original sets of the schemes to reviewers at an interim design conference.

At the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers, the Contractor may proceed to final design with the interior finishes scheme presented.

The SID information and samples are to be submitted in 8 ½" x 11" format using three ring binders with pockets on the inside of the cover. When there are numerous pages with thick samples, use more than one binder. Large Dring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 ½". Provide cover and spine inserts sheets identifying the document as "Structural Interior Design" package. Include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Design submittal requirements include, but are not limited to:

2.1.1. Narrative of the Structural Interior Design Objectives

The SID shall include a narrative that discusses the building related finishes. Include topics that relate to base standards, life safety, sustainable design issues, aesthetics, durability and maintainability, discuss the development and features as they relate to the occupants requirements and the building design.

2.1.2. Interior Color Boards

Identify and key each item item on the color boards to the contract documents to provide a clear indication of how and where each item will be used. Arrange finish samples to the maximum extent possible by room type in order to illustrate room color coordination. Label all samples on the color boards with the manufacturer's name, patterns and colors name and number. Key or code samples to match key code system used on contract drawings.

Material and finish samples shall indicate true pattern, color and texture. Provide photographs or colored photocopies of materials or fabrics to show large overall patterns in conjunction with actual samples to show the actual colors. Finish samples must be large enough to show a complete pattern or design where practical.

Color boards shall include but not be limited to original color samples of the following:

All walls finishes and ceiling finishes, including corner guards, acrylic wainscoting and wall guards/chair rail finishes

All tile information, including tile grout color and tile patterns.

- All flooring finishes, including patterns.
- All door, door frame finishes and door hardware finishes
- All signage, wall base, toilet partitions, locker finishes and operable/folding partitions and trim

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- All millwork materials and finishes (cabinets, counter tops, etc.)
- All window frame finishes and window treatments (sills, blinds, etc.)

Color board samples shall reflect all actual finish textures, patterns and colors required as specified. Patterned samples shall be of sufficient size to adequately show pattern and its repeat if a repeat occurs.

2.1.3. Exterior Color Boards

Prepare exterior finishes color boards in similar format as the interior finishes color boards, for presentation to the reviewers during an interim design conference. Provide original color samples of all exterior finishes including but not limited to the following:

- All Roof Finishes
- All Brick and Cast Stone Samples
- All Exterior Insulation and Finish Samples
- All Glass Color Samples
- All Exterior Metals Finishes
- All Window & Door Frame Finishes
- All Specialty Item Finishes, including trim

Identify each item on the exterior finishes color boards and key to the building elevations to provide a clear indication of how and where each item will be used.

2.2. STRUCTURAL INTERIOR DESIGN DOCUMENTS

2.2.1. General

Structural interior design related drawings must indicate the placement of extents of SID material, finishes and colors and must be sufficiently detailed to define all interior work. The following is a list of minimum requirements:

2.2.2. Finish Color Schedule

Provide finish color schedule(s) in the contract documents. Provide a finish code, material type, manufacturer, series, and color designations. Key the finish code to the color board samples and drawings.

2.2.3. Interior Finish Plans

Indicate wall and floor patterns and color placement, material transitions and extents of interior finishes.

2.2.4. Furniture Footprint Plans

Provide furniture footprint plans showing the outline of all freestanding and systems furniture for coordination of all other disciplines.

2.2.5. Interior Signage

Include interior signage plans or schedules showing location and quantities of all interior signage. Key each interior sign to a quantitative list indicating size, quantity of each type and signage text.

2.2.6. Interior Elevations, Sections and Details

Indicate material, color and finish placement.

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ATTACHMENT B FURNITURE, FIXTURES & EQUIPMENT (FF&E) REQUIREMENTS

1.0 FF&E REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

1.1. FORMAT AND SCHEDULE

Prepare and submit for approval a comprehensive FF&E scheme for an interim design submittal. The Contractor's interior designer, not a furniture dealer, shall develop the design. FF&E is the selection, layout, specification and documentation of furniture includes but is not limited to workstations, seating, tables, storage and shelving, filing, trash receptacles, clocks, framed artwork, artificial plants, and other accessories. Contract documentation is required to facilitate pricing, procurement and installation. The FF&E package is based on the furniture footprint developed in the Structural Interior Design (SID) portion of the interior design. Develop the FF&E package concurrently with the building design to ensure that there is coordination between the electrical outlets, switches, Jboxes, communication outlets and connections, and lighting as appropriate. In addition, coordinate layout with other building features such as architectural elements, thermostats, location of TV's, GF/GI equipment (for example computers, printers, copiers, shredders, faxes), etc. Locate furniture in front of windows only if the top of the item falls below the window and unless otherwise noted, do not attach furniture including furniture systems to the building. If project has SIPRNET and/or NIPRNET, coordinate furniture layout with SIPRNET and NIPRNET separation requirements. Verify that access required by DOIM for SIPRNET box and conduit is provided. The DOR shall interview appropriate Government personnel to determine FF&E requirements for furniture and furnishings prior to preparation of the scheme to be presented. Determine FFE items and quantities by, but not limited to: (1) the number of personnel to occupy the building, (2) job functions and related furniture/office equipment to support the job function, (3) room functions, (4) rank and grade. Present original sets of the scheme to reviewers at an interim design conference upon completion of the interim architectural submittal or three months prior to the submittal of the final FF&E package (whichever comes first).

Design may proceed to final with the FF&E scheme presented at the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers.

Provide six copies of the electronic versions of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide unbound, electronic drawings in CAD and BIM. Provide all files needed to v,/iew complete drawings. Submit all text documents in Microsoft Word or Excel..

Submit four copies of the final and complete FF&E information and samples in 8 ½" x 11" format using three ring binders with pockets on the inside of the cover upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first). Use more than one binder when there are numerous pages with thick samples. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out for upholstery and finish boards. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 ½". Provide cover and spine inserts sheets identifying the document as "Furniture, Fixtures & Equipment" package and include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Provide electronic copies of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide six compact disks with all drawings files needed to view the complete drawings unbound and in the latest version AutoCAD. Provide six additional compact disks of all text documents in Microsoft Word or Excel.

Design submittal requirements include, but are not limited to:

1.1.1. Narrative of Interior Design Objectives

Provide a narrative description of the furniture, to include functional, safety and ergonomic considerations, durability, sustainability, aesthetics, and compatibility with the building design.

1.1.2. Furniture Order Form

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Prepare one Furnishings Order Form for each item specified in the design. This form identifies all information required to order each individual item. In addition to the project name and location, project number, and submittal phase, the order form must include:

- (a) Furniture item illustration and code
- (b) Furniture item name
- (c) Job name, location, and date
- (d) General Services Administration (GSA) FSC Group, part, and section
- (e) Manufacturer, Product name and Product model number or National Stock Number (NSN)
- (f) Finish name and number (code to finish samples)
- (g) Fabric name and number, minimum Wyzenbeek Abrasion Test double rubs (code to fabric samples)
- (h) Dimensions
- (i) Item location by room number and room name
- (j) Quantity per room
- (k) Total quantity
- (I) Special instructions for procurement ordering and/or installation (if applicable)
- (m) Written Product Description: include a non-proprietary paragraph listing the salient features of the item to include but not limited to:
 - (1) required features and characteristics
 - (2) ergonomic requirements
 - (3) functional requirements
 - (4) testing requirements
 - (5) furniture style
 - (6) construction materials
 - (7) minimum warranty

The following is an example for "m" features and characteristics, ergonomic requirements and functional requirements:

Chair Description:

- (1) Mid-Back Ergonomic Task Chair
- (2) Pneumatic Gaslift; Five Star Base
- (3) Mesh Back; Upholstered Seat
- (4) Height and Width Adjustable Task Arms:
 - a. Arm Height: 6"- 11" (+-1/2")
 - b. Arm Width: 2"-4" adjustment
- (5) Height Adjustable Lumbar Support
- (6) Adjustable Seat Height 16"-21" (+- 1")
- (7) Sliding Seat Depth Adjustment 15"-18" (+-1")
- (8) Standard Hard Casters (for carpeted areas)
- (9) Overall Measurements:
 - a. Overall width: 25" 27"
 - b. Overall depth: 25"– 28"

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- (10) Must have a minimum of the following adjustments (In addition to the above):
 - a. 360 Degree Swivel
 - b. Knee-Tilt with Tilt Tension
 - c. Back angle
 - d. Forward Tilt
 - e. Forward Tilt and Upright Tilt Lock

For projects with systems furniture, also provide a written description of the following minimum requirements:

- (1) Type furniture systems (panel, stacking panels, spine wall, desk based system, or a combination)
- (2) Minimum noise reduction coefficient (NRC)
- (3) Minimum sound transfer coefficient (STC)
- (4) Minimum flame spread and smoke development
- (5) UL testing for task lighting and electrical system
- (6) Panel widths and heights and their locations (this may be done on the drawings)Worksurface types and sizes (this may be done on the drawings)
- (7) Worksurface edge type
- (8) Varying panel/cover finish materials and locations (locations may be shown on the drawings)
- (9) Storage requirements
- (10) Keyboard requirements
- (11) Lock and keying requirements
- (12) Accessory components (examples: tack boards, marker boards, paper management)
- (13) Electrical and communication raceway requirement; type, capacity and location (base, beltline, below and/or above beltline)
- (14) Locations of communication cables (base, beltline, below and/or above beltline, top channel)
- (15) Types of electrical outlets
- (16) Types of communication jacks; provided and installed by others
- (17) Locations of electrical outlets and communication jacks (this may be done on the drawings)
- (18) Type of cable (examples: Cat. 5, Cat. 6, fiber optic; UTP or STP, etc.) system needs to support; provided and installed by others

1.1.3. Alternate Manufacturer List

Provide a table consisting of major furniture items that lists the manufacturers products specified on the Order Form and two alternate manufacturers. Major furniture items include, but are not limited to, casegoods, furniture systems, seating, and tables. Organize matrix by item code and item name. Supply alternates that are available on GSA Schedule and meet the requirements of the Furniture Order Form. One of the two alternates must be from UNICOR if possible. Provide manufacturer name address, telephone number, product series and product name for each alternate manufacturer.

1.1.4. FF&E Procurement List

Provide a table that lists all FF&E furniture, mission unique equipment and building Contractor Furnished/Contractor Installed (CF/CI) items. Give each item a code and name and designate whether item will be procured as part of the FF&E furniture, mission unique equipment or the building construction contract. Use the item code to key all FF&E documents including location plans, color boards, data sheets, cost estimate, etc.

1.1.5. Points of Contact (POCs)

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Provide a comprehensive list of POCs needed to implement the FF&E package. This would include but not be limited to appropriate project team members, using activity contacts, interior design representatives, construction contractors and installers involved in the project. In addition to name, address, phone, fax and email, include each contact's job function. Divide the FF&E package into different sections based on this listing, applies to order forms and cost estimates.

1.1.6. Color Boards

Provide color boards for all finishes and fabrics for all FF&E items. Finishes to be included but not limited to paint, laminate, wood finish, fabric, etc.

1.1.7. Itemized Furniture Cost Estimate

Provide an itemized cost estimate of furnishings keyed to the plans and specifications of products included in the package. This cost estimate should be based on GSA price schedules. The cost estimate must include separate line items for general contingency, installation, electrical hook-up for systems furniture or other furniture requiring hardwiring by a licensed electrician, freight charges and any other related costs. Installation and freight quotes from vendors should be use in lieu of a percentage allowance when available. Include a written statement that the pricing is based on GSA schedules. An estimate developed by a furniture dealership may be provided as support information for the estimate, but must be separate from the contractor provided estimate.

1.2. INTERIOR DESIGN DOCUMENTS

1.2.1. Overall Furniture and Area Plans

Provide floor Plans showing locations and quantities of all freestanding, and workstation furniture proposed for each floor of the building. Key each room to a large scale Furniture Placement Plan showing the furniture configuration, of all furniture. Provide enlarged area plans with a key plan identifying the area in which the building is located. Key all the items on the drawings by furniture item code. Do not provide manufacturer specific information such as product names and numbers on drawings, Drawings shall be non-proprietary. This is typical for FFE on all plans, including those mentioned below.

1.2.2. Workstation Plans

Show each typical workstation configuration in plan view, elevations or isometric view. Drawings shall illustrate panels and all major components for each typical workstation configuration. Identify workstations using the same numbering system as shown on the project drawings. Key components to a legend on each sheet which identifies and describes the components along with dimensions. Provide the plan, elevations and isometric of each typical workstation together on the same drawing sheet.

1.2.3. Panel Plans

Show panel locations and critical dimensions from finished face of walls, columns, panels including clearances and aisle widths. Key panel assemblies to a legend which shall include width, height, configuration of frames, panel fabric and finishes (if there are different selections existing within a project), powered or non-powered panel and wall mount locations.

1.2.4. Desk Plans

Provide typical free standing desk configurations in plan view, elevation or isometric view and identify components to clearly represent each desk configuration.

1.2.5. Reflected Ceiling Plans

Provide typical plans showing ceiling finishes and heights, lighting fixtures, heating ventilation and air conditioning supply and return, and sprinkler head placement for coordination of furniture.

1.2.6. Electrical and Telecommunication Plans

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Show power provisions including type and locations of feeder components, activated outlets and other electrical componentsShow locations and quantities of outlets for workstations. Clearly identify different outlets, i.e. electrical, LAN and telecommunication receptacles indicating each type proposed. Show wiring configuration, (circuiting, switching, internal and external connections) and provide as applicable.

1.2.7. Artwork Placement Plans

Provide an Artwork Placement Plan to show location of artwork, assign an artwork item code to each piece of artwork. As an alternative, artwork can be located on the Furniture Plans. Provide a schedule that identifies each piece by room name and number. Provide installation instructions; include mounting height.

1.2.8. Window Drapery Plans

Provide Interior Window Drapery Plans. Key each drapery treatment to a schedule showing color, pattern, material, drapery size and type, draw direction, location and quantities.

1.3. FURNITURE SELECTION

- 1.3.1. Select furniture from the GSA Schedules. Specify furniture available open market when an item is not available on the GSA Schedules. Provide justification fort items not available on the GSA Schedules.
- 1.3.2. To the greatest extent possible when specifying furniture work within a manufacturer's family of furniture for selections, example: Steelcase, Turnstone, Brayton International, Metro, and Vecta are all Steelcase companies. Each alternate should also be specified from a manufacturer's family of furniture, example: first set of alternates would be specified from Knoll's family of furniture and the second from Herman Miller family of furniture. It may be necessary to make some selections from other than a manufacturer's family of furniture if costs are not reasonable for particular items, some items are not available or appropriate for the facility or the items are not on GSA Schedule. If this occurs, consider specifying product from an open line that is accessible by numerous dealerships. Select office furniture including case goods, tables, storage, seating, etc. that is compatible in style, finish and color. Select furniture that complies with ANSI/BIFMA and from manufacturer's standard product line as shown in the most recent published price list and/or amendment and not custom product.

1.4. CONSTRUCTION

- 1.4.1. Provide knee space at workstations and tables that is not obstructed by panels/legs that interfere with knee space of seated person and specificy modesty panels at walls to be of a height or be hinged to allow access to building wall electrical outlets and communication jacks. Provide desks, storage and tables with leveling devices to compensate for uneven floors.
- 1.4.2. Specify workstations and storage of steel construction. Provide worksurface tops constructed to prevent warpage. Provide user friendly features such as radius edges. Do not use sharp edges and exposed connections and ensure the underside of desks, tables and worksurfaces are completely and smoothly finished. Provide abutting worksurfaces that mate closely and are of equal heights when used in side-by-side configurations in order to provide a continuous and level worksurface.
- 1.4.3. Drawers shall stay securely closed when in the closed position and protect wires from damage during drawer operation. Include a safety catch to prevent accidental removal when fully open
- 1.4.4. Unless otherwise noted, provide lockable desks and workstations, filing cabinets and storage. Key all locks within a one person office the same; key all one person offices within a building differently. If an office or open office area has more than one workstation, key all the workstations differently, but key all locks within an individual workstation the same. Use tempered glass glazing when glazing is required. Use light-emitting diode (LED)/solid state lighting where task lighting is required in furniture.

1.5. FINISHES AND UPHOLSTERY

1.5.1. Specify neutral colors for casegoods, furniture systems, storage and tables. Specify desk worksurfaces and table tops that are not too light or too dark in color and have a pattern to help hide soiling. Accent colors are

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allowed in break and lounge areas. Keep placement of furniture systems panel fabric accent colors to a minimum. All finishes shall be cleanable with ordinary household cleaning solutions.

- 1.5.2. Use manufacturer's standard fabrics; including textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Customers Own Material (COM) can be used in headquarter buildings in command suites with executive furniture. Coordinate specific locations with Corps of Engineers Interior Designer.
- 1.5.3. Specify seating upholstery that meets Wyzenbeek Abrasion Test, 55,000 minimum rubs. Specify a soil retardant finish for woven fabrics if Crypton or vinyl upholstery is not provided for seating in dining areas. Use manufacturer's standard fabrics. This includes textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Specify upholstery and finish colors and patterns that help hide soiling. Specify finishes that can be cleaned with ordinary household cleaning solutions.

1.6. ACCESSORIES

- 1.6.1. Specify all accessories required for completely finished furniture installation. Provide filing cabinets and storage for office supplies. Provide tack surfaces at workstations with overhead storage. Provide tackable surfaces at workstations with overhead storage.
- 1.6.2. Not Used.
- 1.6.3. Workstations are to be equipped with stable keyboard trays that have height adjustability, tilting capability, including negative tilt, have a mouse pad at same height as the keyboard tray that can accommodate both left and right handed users, and retractable under worksurface.

1.7. MISSION UNIQUE EQUIPMENT

Funding for FF&E furniture items and mission unique equipment (MUE) items are from two different sources. Separate the designs and procurement documentation for FFE items and MUE. MUE includes, but is not limited to, items such as industrial shelving, workbenches, appliances, fitness equipment, IT equipment and supporting carts. The User will purchase and install mission unique equipment items, unless otherwise noted. Identify locations of known MUE items such as industrial shelving, workbenches, appliances, etc. for space planning purposes.

1.8. SUSTAINABILITY

- 1.8.1. For all designs provided regardless of facility type, make every effort to implement all aspects of sustainability to the greatest extent possible for all the selections made in the FF&E package. This includes but is not limited to the selection of products that consider: **Material Chemistry and Safety of Inputs** (What chemicals are used in the construction of the selections?); **Recyclability** (Do the selections contain recycled content?); **Disassembly** (Can the selections be disassembled at the end of their useful life to recycle their materials?).
- 1.8.2. Make selections to the greatest extent possible of products that possess current McDonough Braungart Design Chemistry (MBDC) certification or other "third-party" certified Cradle to Cradle program, Forest Stewardship Council (FSC) certification, GREENGAURD certification or similar "third-party" certified products consisting of low-emitting materials.

1.9. FURNITURE SYSTEMS

1.9.1. General.

Where appropriate, design furniture systems in open office areas. Coordinate style and color of furniture systems with other storage, seating, etc. in open office areas. Minimize the number of workstation typicals and the parts and pieces required for the design to assist in future reconfiguration and inventorying.

1.9.2. Connector Systems.

Specify a connector system that allows removal of a single panel or spine wall within a typical workstation configuration without requiring disassembly of the workstation or removal of adjacent panels. Specify connector

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system with tight connections and continuous visual seals. When Acoustical panels are used, provide connector system with continuous acoustical seals. Specify concealed clips, screws, and other construction elements, where possible.

1.9.3. Panels and Spine Walls

Specify panels and spine walls with hinged or removable covers that permit easy access to the raceway when required but are securely mounted and cannot be accidentally dislodged under normal conditions. Panels shall be capable of structurally supporting more than 1 fully loaded component per panel per side. Raceways are to be an integral part of the panel and must be able to support lay-in cabling and have a large capacity for electrical and IT. Do not thread cables through the frame.

1.9.4. Electrical And Information/Technology (IT)

Design furniture with electrical systems that meets requirements of UL 1286 when powered panels are required and UL approved task lights that meet requirements of NFPA 70. Dependent on user requirements and Section 01 10 00, paragraph 3 requirements, it is recommended that workstation electrical and IT wiring entry come from the building walls to eliminate the use of power poles and access at the floor. Design electrical and IT systems that are easily accessed in the spine wall and panels without having to move return panels and components. Electrical and IT management will be easily accessible by removable wall covers which can be removed while workstation components are still attached. Specify connector system that has continuation of electrical and IT wiring within workstations and workstation to workstation.

1.9.5. Pedestals

Specify pedestals that are interchangeable from left to right, and right to left, and retain pedestal locking system capability.

1.10. EXECUTIVE FURNITURE

- 1.10.1. Design for executive furniture in command areas, coordinate specific locations with Corps of Engineers Interior Designer. Use upgraded furniture, upholsteries and finishes in command suites. This includes but is not limited to wood casegoods, seating and tables. Select executive furniture casegoods from a single manufacturer and style line, to include workstations, credenzas, filing, and storage, etc.
- 1.10.2. Specify furniture with wood veneer finish (except worksurfaces) with mitered solid wood edge of same wood type. Provide worksurface plastic laminate that closely matches adjacent wood veneer. Other executive office furniture such as seating, tables, executive conference room furniture, etc. shall be compatible in style, finish and color with executive furniture casegoods.

1.11. SEATING

1.11.1. General

Specify appropriate chair casters and glides for the floor finish where the seating is located. Universal casters that are appropriate for both hard surface flooring and carpet are preferred. All seating shall support up to a minimum of 250 lbs.

1.11.2. Desk and Guest Seating

Select ergonomic desk chairs with casters, non-upholstered adjustable arms, waterfall front, swivel, tilt, variable back lock, adjustable back height or adjustable lumbar support, pneumatic seat height adjustment, and padded, contoured upholstered seat and back. Desk and guest chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Depending on scale of desk chair provide seat pan forward and back adjustment to increase or decrease depth of seat pan. All desk chairs shall have an adjustable seat height range of 4 1/2", range to include 16 1/2-20". Select guest chairs that are compatible in style, finish and color with the desk chairs.

1.11.3. Conference Room Seating

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At tables, select ergonomic conference seating with casters, non-upholstered arms, waterfall front, swivel, tilt, pneumatic seat height adjustment, and padded, contoured seat and back, unless otherwise noted. Select arm height and/or design that allows seating to be moved up closely to the table top. Conference chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Perimeter conference chairs shall be compatible in style, finish and color with conference seating at the tables.

1.11.4. Lounge, Waiting and Reception Area Seating

Select seating with arms and cushioned, upholstered seat and back. In heavy use areas, arms shall be easily cleaned such as non-upholstered arms or upholstered arms with wood arm caps unless otherwise noted.

1.11.5. Break Room Seating

Select stackable seating that is easily cleaned. Seating shall be appropriate for table and counter heights as applicable with non-upholstered arms if arms are required. Chairs shall have metal legs and composite materials for seats.

1.11.6. Lounge, Waiting and Reception Furniture.

Design for end and coffee tables with plastic laminate tops that are compatible in style finish and color with the seating.

1.12. FILING AND STORAGE.

Select storage and shelving units that meet customer's functional load requirements for stored items. Specify counterweights for filing cabinets when required by the manufacturer for stability. File drawers shall allow only one drawer to be opened at a time. Provide heavy duty storage and shelving if information is not available.

1.13. TRAINING TABLES.

Don't use plastic laminate self edge. Training tables shall be reconfigurable, moveable and storable; lighter weight folding with dollies or castered as necessary. Specify dollies if required.

1.14. FURNITURE WARRANTIES.

Specify manufacturer's performance guarantees or warranties that include parts, labor and transportation as follows:

Furniture System, unless otherwise noted – 10 year minimum Furniture System Task Lights – 2 year minimum, excluding bulbs Furniture System Fabric – 3 year minimum

Desks - 10 year minimum

Seating, unless otherwise noted - 10 year minimum

Seating Mechanisms and Pneumatic Cylinders - 10 years Fabric - 3 years minimum

Filing and Storage - 10 year minimum

Tables, unless otherwise noted - 10 year minimum

Table Mechanisms – 5 year

Table Ganging Device - 1 year

Items not listed above - 1 year minimum

ATTACHMENT C TRACKING COMMENTS IN DRCHECKS

1.0 General

The Government and DB Contractor shall set up the project in Dr Checks. Throughout the design process, the parties shall enter, track, and back-check comments using the DrChecks system. Government reviewers enter design review comments into DrChecks. Designers of Record shall annotate comments timely and specifically to indicate exactly what action will be taken or why the action is not required. Comments considered critical by the conference participants shall be flagged as such.

2.0 DrChecks Review Comments

The Contractor and the Government shall monitor DrChecks to assure all comments are annotated and agreed to by the designers and reviewers prior to the next submittal. The DrChecks comments and responses shall be printed and included in the design analysis for record.

- 2.1. Conference participants (reviewers) will expect coordination between Design Analysis calculations and the submitted design. Reviewers will also focus on the design submittal's satisfaction of the contract requirements.
- 2.2. The Designers of Record shall answer each comment in DrChecks with a formal response prior to the next submittal, clearly indicating what action will be taken and what drawing/spec will change. Designers of Record are encouraged to directly contact reviewers to discuss and agree to the formal comment responses rather than relying only on DrChecks and review meetings to discuss comments. With the next design conference, reviewers will back-check answers to the comments against the submittal, in addition to reviewing additional design work.
- 2.3. Comments that, in the DB Contractor's opinion, require effort outside the scope of the contract shall be clearly indicated as such in DrChecks. The DB Contractor shall not proceed with work outside the contract until a modification to the contract is properly executed, if one is necessary.

3.0 DrChecks Initial Account Set-Up

To initialize an office's use of DrChecks, choose a contact person within the office to call the DrChecks Help Desk at 800-428-HELP, M-F, 8AM-5PM, Central time. This POC will be given an office password to distribute to others in the office. Individuals can then go to the hyperlink at http://www.projnet.org and register as a first time user. Upon registration, each user will be given a personal password to the DrChecks system.

3.1. Once the office and individuals are registered, the COE's project manager or lead reviewer will assign the individuals and/or offices to the specific project for review. At this point, persons assigned can make comments, annotate comments, and close comments, depending on their particular assignment.

4.0 DrChecks Reviewer Role

The Contractor is the technical reviewer and the Government is the compliance reviewer of the DB designers design documents. Each reviewer enters their own comments into the Dr Checks system. To enter comments:

- 4.1. Log into DrChecks.
- 4.2. Click on the appropriate project.
- 4.3. Click on the appropriate review conference. An Add comment screen will appear.
- 4.4. Select or fill out the appropriate sections (particularly comment discipline and type of document for sorting) of the comment form and enter the comment in the space provided.
- 4.5. Click the Add Comment button. The comment will be added to the database and a fresh screen will appear for the next comment you have.

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4.6. Once comments are all entered, exit DrChecks by choosing "My Account" and then Logout.

5.0 DrChecks Comment Evaluation

The role of the designers of record is to evaluate and respond to the comments entered by the Government reviewers and by the DB Contractor. To respond to comments:

- 5.1. Log into DrChecks.
- 5.2. Click on the appropriate project.
- 5.3. Under "Evaluate" click on the number under "Pending".
- 5.4. Locate the comments that require your evaluation. (Note: If you know the comment number you can use the Quick Pick window on your home page in DrChecks; enter the number and click on go.)
- 5.5. Select the appropriate evaluation (concur, non-concur, for information only, or check and resolve) and add the response.
- 5.6. Click on the Add button. The evaluation will be added to the database and a fresh screen will appear with the next comment.
- 5.7. Once evaluations are all entered, exit DrChecks by choosing "My Account" and then Logout.

6.0 DrChecks Back-check

At the following design conference, participants will back-check comment annotations against newly presented documents to verify that the designers' responses are acceptable and completed. The Contractor and Government reviewers shall either enter additional back-check comments, as necessary or close those that are resolved as a result of the design conferences:

- 6.1. Log into DrChecks.
- 6.2. Click on the appropriate project.
- 6.3. Under "My Backcheck" click on the number under "Pending".
- 6.4. If you agree with the designer's response select "Close Comment" and add a closing response if desired.
- 6.5. If you do not agree with the designer's response or the submittal does not reflect the response given, select "Issue Open", enter additional information.
- 6.6. Click on the Add button. The back-check will be added to the database and a fresh screen will appear with the next comment.
- 6.7. Once back-checks are all entered, exit DrChecks by choosing "My Account" and then Logout. The design is completed and final when there are no pending comments to be evaluated and there are no pending or open comments under back-check.

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ATTACHMENT D SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

Instructions: Use the information outlined in this document to provide the minimum requirement for development of Fire Protection and Life Safety Code submittals for all building projects. Additional and supplemental information may be used to further develop the code review. Insert N/A after criteria, which may be "not applicable".

1.0	SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW
1.1.	Project Name (insert name and location)
1.2.	Applicable Codes and Standards
1.2.1.	Unified Facilities Criteria (UFC): 3-600-01, Design: Fire Protection Engineering For Facilities
1.2.2. limitatior	International Building Code (IBC) for fire resistance requirements, allowable floor area, building height as and building separation distance requirements, except as modified by UFC 3-600-01.
1.2.3. and life s	National Fire Protection Association (NFPA) 101 Life Safety Code (latest edition), for building egress safety and applicable criteria in UFC 3-600-01.
1.2.4. for facilit	ADA and ABA Accessibllity Guidelines. For Buildings and Facilities See Section 01 10 00, Paragraph 3 by specific criteria.
1.3. IBC cha	Occupancy Classification pters 3 and 4
1.4. IBC cha	Construction Type pter 6
1.5. IBC cha _l	Area Limitations pter 5, table 503
1.6. IBC sect	Allowable Floor Areas tion 503, 505
1.7. IBC sect	Allowable area increases tion 506, 507
1.8. IBC sect	Maximum Height of Buildings tion 504
1.9.	Fire-resistive substitution
1.10. IBC table	Occupancy Separations e 302.3.2
1.11.	Fire Resistive Requirements
1.11.1.	Exterior Walls - [] hour rating, IBC table 601, 602
1.11.2.	Interior Bearing walls - [] hour rating
1.11.3.	Structural frame - [] hour rating

1.11.4.

Permanent partitions - [____] hour rating

1.11.5.	Shaft enclosures - [] hour rating
1.11.6.	Floors & Floor-Ceilings - [] hour rating
1.11.7.	Roofs and Roof Ceilings - [] hour rating

- 1.12. Automatic Sprinklers and others used to determine the need for automatic Extinguishing Equipment, Extinguishing Systems, Foam Systems, Standpipe
- 1.12.1. UFC 3-600-01, chapters 4 and 6 systems, wet chemical systems, etc. State which systems are required and to what criteria they will be designed.
- 1.12.2. UFC 3-600-01, Appendix B Occupancy Classification. Note the classification for each room. This may be accomplished by classifying the entire building and noting exceptions for rooms that differ (E.g. The entire building is Light Hazard except boiler room and storage rooms which are [_____], etc.)
- 1.12.3. UFC 3-600-01, Chapter 3 Sprinkler Design Density, Sprinkler Design Area, Water Demand for Hose Streams (supply pressure and source requirements).
- 1.12.4. UFC 3-600-01, Chapter 4 Coverage per sprinkler head. Extended coverage sprinkler heads are not permitted.
- 1.12.5. Available Water Supply. Provide the results of the water flow tests showing the available water supply static pressure and residual pressure at flow. Based on this data and the estimated flow and pressure required for the sprinkler system, determine the need for a fire pump.
- 1.12.6. NFPA 13, Para. 8.16.4.6.1. Provide backflow preventer valves as required by the local municipality, authority, or water purveyor. Provide a test valve located downstream of the backflow preventer for flow testing the backflow preventer at full system demand flow. Route the discharge to an appropriate location outside the building.
- 1.13. Kitchen Cooking Exhaust Equipment

Describe when kitchen cooking exhaust equipment is provided for the project. Type of extinguishing systems for the equipment should be provided, per NFPA 96. Show all interlocks with manual release switches, fuel shutoff valves, electrical shunt trips, exhaust fans, and building alarms.

- 1.14. Portable Fire Extinguishers, fire classification and travel distance. per NFPA 10
- 1.15. Enclosure Protection and Penetration Requirements. Opening Protectives and Through Penetrations
- 1.15.1. IBC Section712, 715 and Table 715.3. Mechanical rooms, exit stairways, storage rooms, janitor [] hour rating. IBC Table 302.1.1
- 1.15.2. Fire Blocks, Draft Stops, Through Penetrations and Opening Protectives
- 1.16. Fire Dampers. Describe where fire dampers and smoke dampers are to be used (IBC Section 716 and NFPA 90A). State whether isolation smoke dampers are required at the air handler.
- 1.17. Detection Alarm and Communication. UFC 3-600-01, (Chapter 5); NFPA 101 para. 3.4 (chapters 12-42); NFPA 72
- 1.18. Mass Notification. Describe building/facility mass notification system (UFC 4-021-01) type and type of base-wide mass notification/communication system. State whether the visible notification appliances will be combined with the fire alarm system or kept separate. (Note: Navy has taken position to combine visible notification appliances with fire alarm).
- 1.19. Interior Finishes (classification). NFPA 101.10.2.3 and NFPA 101.7.1.4
- 1.20. Means of Egress

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Electrical Engineer of Record:

1.20.1.	Separation of Means of Egress, NFPA 101 chapters 7 and 12-42; NFP	A101.7.1.3
1.20.2.	Occupant Load, NFPA101.7.3.1 and chapters 12-42.	
1.20.3.	Egress Capacity (stairs, corridors, ramps and doors) NFPA101.7.3.3	
1.20.4.	Number of Means of Egress, NFPA101.7.4 and chapters 12-42.	
1.20.5.	Dead end limits and Common Path of Travel, NFPA 101.7.5.1.6 and ch	napters 12-42.
1.20.6.	Accessible Means of Egress (for accessible buildings), NFPA101.7.5.4	
1.20.7.	Measurement of Travel Distance to Exits, NFPA101.7.6 and chapters	12-42.
1.20.8.	Discharge from Exits, NFPA101.7.7.2	
1.20.9.	Illumination of Means of Egress, NFPA101.7.8	
1.20.10.	Emergency Lighting, NFPA101.7.9	
1.20.11.	Marking of Means of Egress, NFPA101.7.10	
1.21. Escalators)	Elevators, UFC 3-600-01, Chapter 6; IBC and ASME A17.1 - 2000,(Sa	fety Code for Elevators and
1.22.	Accessibility Requirements, ADA and ABA Accessibility Guidelines for	Buildings and Facilities
	Certification of Fire Protection and Life Safety Code Requirements. (Np if necessary). Preparers of this document certify the accuracy and column Life Safety features for this project in accordance with the attached	mpleteness of the Fire
	Designer of Record. Certification of Fire protection and Life Safety Comment members if necessary). Preparers of this document certify the accuration and Life Safety features of this project.	
Fire Protect	tion Engineer of Record:	
Signature a	and Stamp	
OR		
Architect of	f Record:	
Signature a	and Stamp	
Mechanical	I Engineer of Record:	
Signature a	and Stamp	
Date		

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ATTACHMENT E LEED SUBMITTALS

							20 21
LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v3 Submittals		Provide for Credit Audit Only		ae Submitted (to be filled in by Contractor)	Government Reviewer's Use
	CO	(OCT09)		Pro		Date	
R NERAL		FEATURE	DUE AT		REQUIRED DOCUMENTATION	DATE	REV
	: GENI	ERAL - All calculations shall be in accord	lance with LEED 200	19 R	eference Guide		
					sace.army.mil/enWeb, "Engineering Criteria".		
		·					
(GEN	ERAL - For all credits, narrative/commer	ts may be added to	desc	ribe special circumstances or considerations regarding the project's credit approach.		
,	⊃ENII	EDAL Include all required LEED drouge	as indicated below in		etreet drawings with applicable discipline drawings, labeled For Deference Only		
	JEINI	ENAL - Iliciade all required LEED drawii	gs indicated below ii	I COI	ntract drawings with applicable discipline drawings, labeled For Reference Only.		
١	NOTE	E: Each submittal indicated with "**" diffe	rs from LEED certifie	ed pr	roject submittals by either having a different due date or being an added submittal not re	equired by	GBCI.
c r	check equi	klist identifies what must be submitted to	the Government for ses of compliance w	inter ith p	List of all Final Design submittals revised after final design to reflect actual closeout conditions. Revised Final Design submittals OR - Statement confirming that no changes have been made since final design that effect final design submittal		Proj Engr
		OUOTAINA DI E CITTO	Closeout		documents.		(PE)
TEGOR	RY 1 -	- SUSTAINABLE SITES	1	1	<u> </u>	1	
		Construction Activity Pollution			List of drawings and specifications that address the erosion control, particulate/dust		
PR1		Prevention (PREREQUISITE)	**Final Design		control and sedimentation control measures to be implemented.		CIV
		,	**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
					Narrative that indicates which compliance path was used (NPDES or Local standards) and describes the measures to be implemented on the project. If a local		
			**Final Design		standard was followed, provide specific information to demonstrate that the local standard is equal to or more stringent than the NPDES program.		CIV
1		Site Selection	Final Design		standard is equal to or more stringent than the NPDES program. Statement confirming that project does not meet any of the prohibited criteria.		CIV
1				X	standard is equal to or more stringent than the NPDES program. Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies.		
		Site Selection Development Density & Community Connectivity	Final Design **Final Design Final Design Final Design	X	standard is equal to or more stringent than the NPDES program. Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale.		CIV
2		Development Density & Community	Final Design **Final Design Final Design	x	standard is equal to or more stringent than the NPDES program. Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development.		CIV
		Development Density & Community	Final Design **Final Design Final Design Final Design	x	standard is equal to or more stringent than the NPDES program. Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale.		CIV
		Development Density & Community	Final Design **Final Design Final Design Final Design **Final Design	x	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site.		CIV CIV CIV
		Development Density & Community	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design	X	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities		CIV CIV CIV CIV
		Development Density & Community	Final Design **Final Design Final Design **Final Design **Final Design	X	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site.		CIV CIV CIV CIV
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2		Development Density & Community	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design	X	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, spedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield.		CIV CIV CIV CIV CIV
		Development Density & Community Connectivity	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design	x	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: LEED Site vicinity plans sname and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield.		CIV CIV CIV CIV
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2		Development Density & Community Connectivity Brownfield Redevelopment Alternative Transportation: Public	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design Final Design **Final Design	x	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield. Delineation and labeling of "LEED Project site boundary" on site plan. Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information. Delineation and labeling of "LEED Project site boundary" on site plan.		CIV CIV CIV CIV CIV CIV CIV
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3		Development Density & Community Connectivity Brownfield Redevelopment Alternative Transportation: Public	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design	X	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield. Delineation and labeling of "LEED Project site boundary" on site plan. Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information. Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
3		Development Density & Community Connectivity Brownfield Redevelopment Alternative Transportation: Public	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design Final Design **Final Design **Final Design	x	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield. Delineation and labeling of "LEED Project site boundary" on site plan. Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: LEED Site vicinity plan showing project site, mass transit stops and pedestrian path to them with path distance noted.		CIV
		Development Density & Community Connectivity Brownfield Redevelopment Alternative Transportation: Public Transportation Access	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design	x	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield. Delineation and labeling of "LEED Project site boundary" on site plan. Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted. Option 2: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted.		CIV
2		Development Density & Community Connectivity Brownfield Redevelopment Alternative Transportation: Public	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design	x	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield. Delineation and labeling of "LEED Project site boundary" on site plan. Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted.		CIV
3 4.1		Development Density & Community Connectivity Brownfield Redevelopment Alternative Transportation: Public Transportation Access	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design **Final Design **Final Design Final Design	x	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield. Delineation and labeling of "LEED Project site boundary" on site plan. Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: LEED Site vicinity plan showing project site, mass transit stops and pedestrian path to them with path distance noted. FTE calculation. Bicycle storage spaces calculation. Shower/changing facilities calculation. List of drawings that show the location(s) of bicycle storage are		CIV
3 4.1		Development Density & Community Connectivity Brownfield Redevelopment Alternative Transportation: Public Transportation Access	Final Design **Final Design Final Design **Final Design **Final Design Final Design Final Design Final Design **Final Design **Final Design **Final Design Final Design Final Design Final Design Final Design	x	Statement confirming that project does not meet any of the prohibited criteria. Delineation and labeling of "LEED Project site boundary" on site plan. LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies. Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius. Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site. Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan. Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield. Delineation and labeling of "LEED Project site boundary" on site plan. Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information. Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted.		CIV

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LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v3 Submittals (OCT09)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Govemment Reviewer's Use
AR	0	FEATURE	DUE AT		REQUIRED DOCUMENTATION	DATE	REV
		Alternative Transportation: Low Emitting		1	Statement indicating which option for compliance applies. FTE calculation.	1	
S4.3		& Fuel Efficient Vehicles	Final Design		Statement indicating total parking capacity of site.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Low-emission & fuel-efficient vehicle calculation.		CIV
			Final Design		Option 1: List of drawings and specification references that show location and		CIV
			Final Design		number of preferred parking spaces for low-emission & fuel-efficient vehicles and signage.		CIV
			Final Design		Option 1: Statement indicating quantity, make, model and manufacturer of low- emission & fuel-efficient vehicles to be provided. Statement confirming vehicles are zero-emission or indicating ACEEE vehicle scores.		CIV
			Final Design	-	Option 2: Low-emission & fuel-efficient vehicle parking calculation.	1	CIV
			Final Design		Option 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design		Option 3: Low-emission & fuel-efficient vehicle refueling station calculation.		CIV
			Final Design		Option 3: List of drawings and specifications indicating location and number of refueling stations, fuel type and fueling capacity for each station for an 8-hour period. Option 3: Construction product submittals indicating what was provided and		CIV
			Closeout	Х	confirming compliance with respect to fuel type and fueling capacity for each station for an 8-hour period.		CIV
		Alternative Transportation: Parking					
34.4		Capacity	Final Design		Statement indicating which option for compliance applies.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan. Option 1: Preferred parking calculation including number of spaces required, total		CIV
			Final Design		provided, preferred spaces provided and percentage.		CIV
					Option 2: FTE calculation. Preferred parking calculation including number of spaces		
			Final Design		provided, preferred spaces provided and percentage. Options 1 and 2: List of drawings and specification references that show location and		CIV
			Final Design		number of preferred parking spaces and signage. Option 3: Narrative indicating number of spaces required and provided and		CIV
			Final Design		describing infrastructure and support programs with description of project features to support them.		CIV
35.1		Site Development: Protect or Restore Habitat	**Final Design		Option 1: List of drawing and specification references that convey site disturbance limits.		CIV
JU. I		Habitat	**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design		Option 2: LEED site plan drawing that delineates boundaries of each preserved and restored habitat area with area (sf) noted for each. Option 2: Percentage calculation of restored/preserved habitat to total site area. List		CIV
			**Final Design		of drawings and specification references that convey restoration planting requirements.		CIV
					Option 2: LEED site plan drawing delineating boundary of vegetated open space		
_		Site Development: Maximize Open			adjacent to building with areas of building footprint and designated open space		
55.2	\vdash	Space	Final Design **Final Design	<u> </u>	noted. Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		<u> </u>	i iiiai Desigli	<u> </u>	pomication and labeling of LLED Floject site boundary. On site plan.		OI V
6.1		Stormwater Design: Quantity Control	Final Design		Statement indicating which option for compliance applies.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		UΙV
			Final Do.		Option 1: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf) -OR - Narrative describing site conditions, measures and controls to be		On t
			Final Design	<u> </u>	implemented to prevent excessive stream velocities and erosion. Option 2: Indicate pre-development and post-development runoff rate(cfs) and runoff		CIV
			Final Design		quantity (cf). Indicate percent reduction in each.		CIV
					For non-structural controls, list all BMPs used and, for each, describe the function of		
					the BMP and indicate the percent annual rainfall treated. List all structural controls and, for each, describe the pollutant removal and indicate the percent annual rainfall		
SS6.2		Stormwater Design: Quality Control	Final Design **Final Design	<u> </u>	treated. Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
	1	<u> </u>	i iiiai Desigli	<u> </u>	pomication and labeling of LLED Floject site boundary. On site plan.	1	OI V
				_			
SS7.1		Heat Island Effect: Non-Roof	**Final Design		LEED site plan drawing indicating locations and quantities of each paving type, including areas of shaded pavement. Percentage calculation indicating percentage o reflective/shaded/open grid area.	f	CIV

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u d	Check Here if Credit is Claimed			dit Only		Date Submitted (to be filled in by Contractor)	r's Use
EED Credit Paragraph	Contractor Check Her	LEED-NC v3 Submittals		Provide for Credit Audit		e Submitted (to be	Government Reviewer's Use
니 PAR	Ŝ	(OCT09)	DUE AT	Pro	REQUIRED DOCUMENTATION	DATE	မို REV
	1	I LATORE	1 202 A1	1	Option 1: Percentage calculation indicating percentage of SRI compliant roof area.	DATE	11.2.4
S7.2		Heat Island Effect: Roof	Final Design		List of drawings and specification references that convey SRI requirements and roof slopes.		ARC
			Final Design		Option 1: List of specified roof materials indicating, for each, type, manufacturer, product name and identification if known, SRI value and roof slope.		ARC
			**Closeout		Option 1: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	Х	Option 1: Manufacturer published product data or certification confirming SRI		PE
			Final Design Final Design		Option 2: Percentage calculation indicating percentage of vegetated roof area. Option 3: Combined reflective and green roof calculation.		ARC
			Final Design		Option 3: List of specified roof materials indicating, for each, type, manufacturer, product name and identification if known, SRI value and roof slope.		ARC
			********		Option 3: List of installed roof materials indicating, for each, manufacturer, product		DE
			**Closeout Closeout	Х	name and identification, SRI value and roof slope. Option 3: Manufacturer published product data or certification confirming SRI		PE PE
SS8		Light Pollution Reduction	Final Design **Final Design		Interior Lighting: List of drawings and specification references that convey interior lighting requirements (location and type of all installed interior lighting, location of non-opaque exterior envelope surfaces, allowing confirmation that maximum candela value from interiorfixtures does not intersect non-opaque building envelope surfaces) - OR - List of drawings and specification references that show automatic lighting controls compliance with credit requirement. Delineation and labeling of "LEED Project site boundary" on site plan.		ELEC ELEC
			Final Design		Exterior Lighting: List of drawings and specification references that convey exterior lighting requirements (location and type of all site lighting and building façade/landscape lighting).		ELEC
			Final Design		Exterior Site Lighting Power Density (LPD): Tabulation for exterior site lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all site lighting.		ELEC
			a. 200igii		Exterior Building Facade/Landscape Lighting Power Density (LPD): Tabulation for exterior building facade/landscape lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of		
			Final Design	<u> </u>	location. Percentage calculation of actual versus allowable LPD for all building facade/landscape lighting.	<u> </u>	ELEC
			Final Design		Exterior Lighting IESNA Zone: Indicate which IESNA zone is applicable to the project.		ELEC
			Final Design		Exterior Lighting Site Lumen table indicating, for each fixture type, quantity installed, initial lamp lumens per luminaire, initial lamp lumens above 90 degrees from Nadir, total lamp lumens and total lamp lumens above 90 degrees. Percentage of site lamp lumens above 90 degrees from nadir to total lamp lumens.		ELEC
			Final Design		Exterior Lighting Narrative describing analysis used for addressing requirements for light trespass at site boundary and beyond.		ELEC
ATEGO	RY 2	- WATER EFFICIENCY					
VEPR1	2	Water Use Reduction: 20% Reduction	Final Design		Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design		Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
	<u>L</u>		Final Design		Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
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Tuesday, October 26, 2010

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Paragraph	Check Here if Credit is Claimed			Credit Audit Only		Submitted (to be filled in by Contractor)	Government Reviewer's Use
LEED Credit Paragraph	Contractor Ch	LEED-NC v3 Submittals (OCT09)	DUE AT	Provide for Cr	REQUIRED DOCUMENTATION	TADA Date Submitte	Government F
ur.		TEATORE			Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in	DAIL	
			Final Design		occupancy calculation and annual baseline flush fixture water usage. Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in		MEC
			Final Design Closeout	Х	occupancy calculation and annual design case flush fixture water usage. Manufacturer published product data or certification confirming fixture water usage.		MEC PE
Ē1.1		Water Efficient Landscaping: Reduce by 50%	Final Design		Statement indicating which option for compliance applies.		CIV
			**Final Design Final Design		Delineation and labeling of "LEED Project site boundary" on site plan. Calculation indicating, for baseline and design case, total water applied, total potable water applied, total non-potable water applied. Design case percent potable water reduction. If nonpotable water is used, indicate source of nonpotable water.		CIV
			Final Design		List of landscape plan drawings. Narrative describing landscaping and irrigation design strategies, including water use calculation methodology used to determine savings and, if non-potable water is used,		CIV
E1 2		Water Efficient Landscaping: No	Final Design		specific information about source and available quantity.		CIV
E1.2 E2		Potable Water Use or No Irrigation Innovative Wastewater Technologies	Same as WE1.1 Final Design		Same as WE1.1 Statement confirming which option for compliance applies.		MEC
			Final Design		Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design		Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design		Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
			Final Design		Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design		Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Final Design		Option 1: If onsite non-potable water is used, identify source(s), indicate annual quantity from each source and indicate total annual quantity from all onsite non-potable water sources.		MEC
			Final Design		Option 1: Summary calculation indicating baseline annual water consumption, design case annual water consumption, non-potable annual water consumption and total percentage annual water savings.		MEC
			Final Design		Option 2: Statement confirming on-site treatment of all generated wastewater to tertiary standards and all treated wastewater is either infiltrated or used on-site. Option 2: List of drawing and specification references that convey design of on-site		MEC
			Final Design		wastewater treatment features.		CIV
			Final Design		Option 2: On-site water treatment quantity calculation indicating all on-site wastewater source(s), annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from each source and totals for annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from all sources. Option 2: Wastewater summary calculation indicating design case annual flush from the contraction of t		CIV
			Final Design		fixture water usage, annual on-site water treatment and percentage sewage convyance reduction. Narrative describing project strategy for reduction of potable water use for sewage conveyance, including specific information on reclaimed water usage and treated		MEC
		Water Use Reduction: 30% - 40%	Final Design		wastewater usage.		MEC
/E3		Reduction - ENERGY AND ATMOSPHERE	Same as WEPR1	<u> </u>	Same as WEPR1		MEC

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		Fundamental Commissioning of the Building Energy Systems	2027				
EAPR1		(PREREQUISITE)	**Final Design		**Owner's Project Requirements document		ALL
			**Final Design		**Basis of Design document for commissioned systems		MEC, ELEC
			**Final Design		**Commissioning Plan		MEC, ELEC
			Closeout		Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
			Closeout		Commissioning Report Statement listing the mandatory provisions of ASHRAE 90.1 that project meets		PE MEC
TADDO.		Minimum Energy Performance	Final Danian		relative to compliance with this prerequisite and indicating which compliance path was used.		ELEC
EAPR2		(PREREQUISITE)	Final Design Final Design		Statement indicating which compliance path option applies.		ARC MEC
			Final Design		Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		MEC
			Final Design		Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.		MEC
			Final Design		Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category		MEC
			Final Design		Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		MEC
			Final Design		Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type		MEC
			Final Design		Option 1: Energy type summary lising, for each energy type, utility rate description, units of energy and units of demand		MEC
			Final Design		Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost		MEC
			Final Design		Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		MEC
			Final Design		Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative		MEC
			Final Desire		Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use	ı	MEG
+			Final Design		for each orientation and total annual process energy use. Option 1: Baseline energy cost table indicating, for each energy type, annual cost for		MEC
+			Final Design		all four orientations and building total energy cost.		MEC
			Final Design		Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.		MEC
			Final Design		Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design		Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.		MEC

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use and annual energy cost.

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Final Design

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					Option 1: Compliance summaries from energy simulation software. If software does		
					not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output		
					summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most		
					common systems and must include occupancy, use pattern, assumed envelope		
			Final Design		component sizes and descriptive features and assumed mechanical equipment types and descriptive features		MEC
			Final Design		Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		MEC
A2.1		On-Site Renewable Energy	Final Design		Statement indicating which compliance path option applies.		ELEC
					List all on-site renewable energy sources and indicate, for each source, backup		
					energy type, annual energy generated, rated capacity and renewable energy cost.		
			Final Design		Indicate total annual energy use (all sources), total annual energy cost (all sources) and percent renewable energy cost.		ELEC MEC
			Final Design		Option 1: Indicate, for renewable energy,proposed design total annual energy generated and annual cost.		ELEC MEC
			r mar Booign		gonorated and annual coot.		IVILO
					Option 2: Indicate CBECS building type and building gross area. Provide the following CBECS data: median annual electrical intensity, median annual non-electrical fuel intensity, average electric energy cost, average non-electric fuel cost,		ELEC
			Final Design		annual electric energy use and cost, annual non-electric fuel use and cost. Option 2: Narrative describing renewable systems and explaining calculation		MEC
			Final Design		method used to estimate annual energy generated, including factors influencing performance.		ELEC MEC
A2.2		On-Site Renewable Energy	Same as EA2.1		Same as EA2.1		ELEC MEC
A2.3		On-Site Renewable Energy	Same as EA2.1		Same as EA2.1		ELEC MEC
A3		Enhanced Commissioning	**Final Design		**Owner's Project Requirements document (OPR)		ALL
			**Final Design		**Basis of Design document for commissioned systems (BOD)		ELEC MEC
			**Final Design		**Commissioning Plan		ELEC MEC
			-		Statement confirming all commissioning requirements have been incorporated into		
			Closeout Closeout		construction documents. **Commissioning Report		PE PE
			**Final Design		Statement by CxA confirming Commissioning Design Review Statement by CxA confirming review of Contractor submittals for compliance with		
			Closeout Closeout		OPR and BOD **Systems Manual		PE PE
			Closeout		Statement by CxA confirming completion of O&M staff and occupant training		PE
			Closeout		**Scope of work for post-occupancy review of building operation, including plan for resolution of outstanding issues		PE
			**Predesign		Statement confirming CxA qualifications and contractual relationships relative to work on this project, demonstrating that CxA is an independent third party.		MEC
A4		Enhanced Refrigerant Management	Final Design		Refrigerant impact calculation table with all building data and calculation values as shown in LEED 2009 Reference Guide Example Calculations		MEC
			Final Design		Narrative describing any special circumstances or explanatory remarks		
٨٥		Management 9 Visites at a	Closeout	Χ	Cut sheets highlighting refrigerant data for all HVAC components.		PE
45	1	Measurement & Verification	Closeout		Statement indicating which compliance path option applies.		PE
	1		Closeout		Measurement and Verification Plan including Corrective Action Plan **Scope of work for post-occupancy implementation of M&V plan including corrective		PE
				1	action plan.		PE
A.C.		0	Closeout				-
A6		Green Power	Closeout		Statement indicating which compliance path option applies.		PE PF
EA6		Green Power					PE PE PE

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			Closeout Closeout		Green power provider summary table indicating, for each purchase type, provider name, annual quantity green power purchased and contract term. Indicate total annual green power use and indicate percent green power Narrative describing how Green Power or Green Tags are purchased		PE PE
	5 17.1				<u> </u>	•	
CATEGO	KY4	- MATERIALS AND RESOURCES		1	Statement confirming that recycling area will accommodate recycling of pleatic		\vdash
MRPR1		Storage & Collection of Recyclables (PREREQUISITE)	Final Design		Statement confirming that recycling area will accommodate recycling of plastic, metal, paper, cardboard and glass. Narrative indicating any other materials addressed and coordination with pickup.		ARC
MD1 1		Building Reuse: Maintain 55% of	**Final Design		If project includes a building addition, confirm that area of building addition does not		ADC
MR1.1		Existing Walls, Floors & Roof	**Final Design		exceed 2x the area of the existing building. Spreadsheet listing, for each building structural/envelope element, the existing area		ARC
	-	Building Reuse: Maintain 75% of	**Final Design		and reused area. Total percent reused.		ARC
MR1.2		Existing Walls, Floors & Roof	Same as MR1.1		Same as MR1.1		ARC
MR1.3		Building Reuse: Maintain 95% of Existing Walls, Floors & Roof	Same as MR1.1		Same as MR1.1		ARC
		Building Reuse: Maintain 50% of			If project includes a building addition, confirm that area of building addition does not		
MR1.4		Interior Non-Structural Elements	**Final Design		exceed 2x the area of the existing building. Spreadsheet listing, for each building interior non-structural element, the existing		ARC
		Construction Waste Management:	**Final Design		area and reused area. Total percent reused.		ARC
MR2.1		Divert 50% From Disposal	**Preconstruction		Waste Management Plan		PE
			**Construction Quarterly and Closeout		Spreadsheet calculations indicating material description, disposal/diversion location (or recycling hauler), weight, total waste generated, total waste diverted, diversion percentage		PE
			**Construction Quarterly and Closeout		Receipts/tickets for all items on spreadsheet		PE
MR2.2		Construction Waste Management: Divert 75% From Disposal	Same as MR2.1		Same as MR2.1		PE
		·					
MR3.1		Materials Reuse: 5%	Closeout		Statement indicating total materials value and whether default or actual. Spreadsheet calculations indicating, for each reused/salvaged material, material		PE
MDOO		Materials Devices 400/	Closeout		description, source or vendor, cost. Total reused/salvaged materials percentage.		PE
MR3.2		Materials Reuse: 10% Recycled Content: 10% (post-	Same as MR3.1		Same as MR3.1		PE
MR4.1		consumer + 1/2 pre-consumer)	Closeout		Statement indicating total materials value and whether default or actual.		PE
					Spreadsheet calculations indicating, for each recycled content material, material name/description, manufacturer, cost, post-consumer recycled content percent, preconsumer recycled content percent, source of recycled content data. Total post-consumer content materials cost, total pre-consumer content materials cost, total		
			Closeout		combined recycled content materials cost, recycled content materials percentage.		PE
			Final Design or NLT		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated		
	_		Preconstruction		quantities to show strategy for achieving goal. Manufacturer published product data or certification, confirming recycled content		PE
			Closeout	Х	percentages in spreadsheet		PE
MR4.2		Recycled Content: 20% (post- consumer + 1/2 pre-consumer)	Same as MR4.1		Same as MR4.1		PE
MR5.1		Regional Materials:10% Extracted, Processed & Manufactured Regionally	Closeout		Statement indicating total materials value and whether default or actual.		PE
					Spreadsheet calculations indicating, for each regional material, material name/description, manufacturer, cost, percent compliant, harvest distance,		
			Closeout		manufacture distance, source of manufacture and harvest location data. Total regional materials cost, regional materials percentage.		PE
					**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated		
			Preconstruction		quantities to show strategy for achieving goal. Manufacturer published product data or certification confirming regional material		PE
			Closeout	Х	percentages in spreadsheet		PE

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/IR5.2		Regional Materials:20% Extracted, Processed & Manufactured Regionally	Same as MR5.1		Same as MR5.1		PE
1R6		Rapidly Renewable Materials	Closeout		Statement indicating total materials value and whether default or actual.		PE
			Closeout		Spreadsheet calculations indicating, for each rapidly renewable material, material name/description, manufacturer, cost, rapidly renewable content percent, rapidly renewable product value. Total rapidly renewable product value, rapidly renewable materials percentage.		PE
			Final Design		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		ARC
			Closeout	Х	Manufacturer published product data or certification confirming rapidly renewable material percentages in spreadsheet		PE
1R7		Certified Wood	Closeout		Statement indicating total materials value and whether default or actual.		PE
			Closeout		Spreadsheet calculations indicating, for each certified wood material, material name/description, vendor, cost, wood component percent, certified wood percent of wood component, FSC chain of custody certificate number. Total certified wood product value, certified wood materials percentage.		PE
			Final Design or NLT Preconstruction		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	X	Vendor invoices, FSC chain of custody certificates and anufacturer published product data or certification confirming all certified wood materials percentages in spreadsheet.	i	PE
INDOOD	ENV	RONMENTAL QUALITY					
QPR1	EINV	Minimum IAQ Performance (PREREQUISITE)	Final Design		Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		MEC
QFN1		(FREREGUISITE)	Final Design		Narrative describing the project's ventilation design, including specifics about fresh air intake volumes and special considerations. Statement indicating which option for compliance applies, stating applicable		MEC
QPR2		Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Final Design		criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		ARC
			Final Design		List of drawing and specification references that convey conformance to applicable requirements (signage, exhaust system, room separation details, etc).		ARC
<u>Q1</u>		Outdoor Air Delivery Monitoring	Final Design		Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements. List of drawing and specification references that convey conformance to applicable		MEC
			Final Design		requirements. Narrative describing the project's ventilation design and CO2 monitoring system,		MEC
			Final Design Closeout	Х	including specifics about monitors, operational parameters and setpoints. Cut sheets for CO2 monitoring system.		MEC PE
:Q2		Increased Ventilation	Final Design		Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements. Narrative describing the project's ventilation design, including specifics about zone	<u> </u>	MEC
			Final Design		fresh air intake volumes and demonstrating compliance. Option 2: Narrative describing design method used for determining natural ventilation design, including calculation methodology/model results and demonstrating		MEC
			Final Design Final Design		compliance. List of drawing and specification references that convey conformance to applicable requirements.		MEC MEC
Q3.1		Construction IAQ Management Plan: During Construction	**Preconstruction		Construction IAQ Management Plan		PE
			Closeout		Statement confirming whether air handling units were operated during construction		PE
			Closeout		Dated jobsite photos showing examples of IAQ management plan practices being implemented. Label photos to indicate which practice they demonstrate. Minimum one photo of each practice at each building.		PE
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		1 = 11 0 11 =			Spreadsheet indicating, for each filter installed during construction, the manufacturer,		
			Closeout		model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy.		PE
20.0		Construction IAQ Management Plan:					
23.2		Before Occupancy	**Preconstruction		Construction IAQ Management Plan		PE
					Statement indicating which option for compliance applies and confirming that		
	<u> </u>		Closeout		required activities have occurred that meet the applicable requirements. Option 1a: Narrative describing the project's flushout process, including specifics		PE
					about temperature, airflow and duration, special considerations (if any) and		
			Closeout		demonstrating compliance.		PE
					Option 1b: Narrative describing the project's pre-occupancy and post-occupancy		
			Closeout		flushout processes, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Gioseout		personal considerations (if any) and demonstrating compilative.		
					Option 2: Narrative describing the project's IAQ testing process, including specifics		
			Closeout		about contaminants tested for, locations, remaining work at time of test, retest parameters and special considerations (if any).		PE
			Closeout		Option 2: IAQ testing report demonstrating compliance.		PE
		Low Emitting Motoriolo, Adhaniyan 9			Spreadsheet indicating, for each applicable indoor adhesive, sealant and sealant		
Q4.1		Low Emitting Materials: Adhesives & Sealants	Closeout		primer used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
					Spreadsheet indicating, for each applicable indoor aerosol adhesive, the manufacturer, product name/model number, VOC content, LEED VOC limit, and		
					source of VOC data - OR - Statement confirming no indoor aerosol adhesives were		
			Closeout		used for the project. Manufacturer published product data or certification confirming material VOCs in		PE
			Closeout	Х	spreadsheet		PE
		Low Emitting Materials: Paints &			Spreadsheet indicating, for each applicable indoor paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and		
Q4.2		Coatings	Closeout		source of VOC data.		PE
					Spreadsheet indicating, for each applicable indoor anti-corrosive/anti-rust paint and		
					coating used, the manufacturer, product name/model number, VOC content, LEED		
			Closeout		VOC limit, and source of VOC data - OR - Statement confirming no indoor anti- corrosive/anti-rust paints were used for the project.		PE
					Manufacturer published product data or certification confirming material VOCs in		
			Closeout	X	spreadsheet		PE
		Law Carittia Materials Classics			Spreadsheet indicating, for each indoor flooring system used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of		
Q4.3		Low Emitting Materials: Flooring Systems	Closeout		LEED compliance data.		PE
					Spreadsheet indicating, for each indoor carpet cushion used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of		
					LEED compliance data - OR - Statement confirming no indoor carpet cushion was		
			Closeout		used for the project. Manufacturer published product data or certification confirming material compliance		PE
			Closeout	Х	label in spreadsheet		PE
					Spreadsheet indicating, for each indoor composite wood and agrifiber product used,		
.		Low Emitting Materials: Composite	0:		the manufacturer, product name/model number, if it contains added urea		_
Q4.4	 	Wood & Agrifiber Products	Closeout		formaldehyde (yes/no) and source of LEED compliance data. Manufacturer published product data or certification confirming material urea		PE
	_	Indoor Chemical & Pollutant Source	Closeout	Χ	formaldehyde in spreadsheet Spreadsheet indicating, for each permanent entryway system used, the		PE
Q 5		Control	Closeout	L	manufacturer, product name/model number and description of system.		PE
			Final Design		List of drawing and specification references that convey locations and installation methods for entryway systems.		ARC
			i iliai Desigli		inicinado foi offuryway oyotomo.		AINO
					Spreadsheet indicating, for each chemical use area, the room number, room name,		
					description of room separation features (walls, floor/ceilings, openings) and pressure differential from surrounding spaces with doors closed - OR - Statement confirming		
			Final Dasies		that project includes no chemical use areas and that no hazardous cleaning materials		ARC MEC
			Final Design		are needed for building maintenance. If project includes chemical use areas: List of drawing and specification references		
	1	İ	I	1	that convey locations of chemical use areas, room separation features and exhaust	Ì	ARC

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			Final Design		If project includes places where water and chemical concentrate mixing occurs: List of drawing and specification references that convey provisions for containment of hazardous liquid wastes OR - Statement confirming that project includes no places where water and chemical concentrate mixing occurs.		ARC MEC
			Closeout		If project includes chemical use areas: Spreadsheet indicating, for AHUs/mechanical ventilation equipment serving occupied areas, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy (yes/no) - OR - Statement confirming that project does not use mechanical equipment for ventilation of occupied areas.		PE
Q6.1		Controllability of Systems: Lighting	Final Design		Calculation indicating total number of individual workstations, number of workstations with individual lighting controls and the percentage of workstations with individual lighting controls.		ELEC
			Final Design		For each shared multi-occupant space, provide a brief description of lighting controls.		ELEC
			Final Design		Narrative describing lighting control strategy, including type and location of individual controls and type and location of controls in shared multi-occupant spaces.		ELEC
		Controllability of Systems: Thermal			Calculation indicating total number of individual workstations, number of workstations with individual thermal comfort controls and the percentage of workstations with		
Q6.2		Comfort	Final Design		individual thermal comfort controls. For each shared multi-occupant space, provide a brief description of thermal comfort		MEC
			Final Design Final Design		controls. Narrative describing thermal comfort control strategy, including type and location of individual and shared multi-occupant controls.		MEC
			r mar 200igi.		Design criteria spreadsheet indicating, for spring, summer, fall and winter, maximum indoor space design temperature, minimum indoor space design temperature and		20
Q7.1		Thermal Comfort: Design	Final Design		maximum indoor space design humidity. Narrative describing method used to establish thermal comfort control conditions and		MEC
			Final Design		how systems design addresses the design criteria, including compliance with the referenced standard.		MEC
Q7.2		Thermal Comfort: Verification	Final Design		Narrative describing the scope of work for the thermal comfort survey, including corrective action plan development		MEC
			Final Design		List of drawing and specification references that convey permanent monitoring system.		MEC
		Daylight & Views: Daylight 75% of			Option 2: Table indicating all regularly occupied spaces with space area and space area with compliant daylight zone. Sum of regularly occupied areas and regularly occupied areas withcompliant daylight zone. Percentage calculation of areas		
Q8.1		Spaces	Final Design		withcompliant daylight zone to total regularly occupied areas.		ARC
			Final Design Final Design		Option 1: Simulation model method, software and output data Option 1: Table indicating all regularly occupied spaces with space area, space area with minimum 25 footcandles daylighting illumination, and method of providing glare control. Sum of regularly occupied areas and regularly occupied areas with 25 fc daylighting. Percentage calculation of areas with 25 fc daylighting to total regularly occupied areas.		ELEC
			Final Design		For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design		List of drawing and specification references that convey exterior glazed opening head and sill heights, glazing performance properties and glare control/sunlight redirection devices.		ARC
			Closeout	х	Manufacturer published product data or certification confirming glazing Tvis in spreadsheet Table indicating all regularly occupied spaces with space area and space area with		PE
Q8.2		Daylight & Views: Views for 90% of Spaces	Final Design		access to views. Sum of regularly occupied areas and regularly occupied areas with access to views. Percentage calculation of areas with views to total regularly occupied areas.		ARC
		O passo			For all occupied spaces excluded from the calculation, provide narrative indicating		
			Final Design		reasons for excluding the space. LEED Floor plan drawings showing line of sight diagramming of views areas in each regularly occupied space. List of drawing/specification references that convey		ARC
			Final Design		exterior glazed opening head and sill heights.		ARC

Tuesday, October 26, 2010

EED Credit Paragraph	=	LEED-NC v3 Submittals (OCT09)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use
PAR	U	FEATURE	DUE AT	ш	REQUIRED DOCUMENTATION	DATE	REV
Dc1.1		Innovation in Design	Final Design		Narrative decribing intent, requirement for credit, project approach to the credit. List of drawings and specification references that convey implementation of credit. All other documentation that validates claimed credit.		
Dc1.2		Innovation in Design	Final Design				
Dc1.3 Dc1.4		Innovation in Design Innovation in Design	Final Design Final Design	-			
JU1.4	-	mnovation in Design	rinai Design		Narrative indicating name of LEED AP, company name of LEED AP, description of		

ATTACHMENT F

Version 07-07-2010

BUILDING INFORMATION MODELING REQUIREMENTS

1.0 Section 1 - Submittal Format

1.1. <u>Design Deliverables</u>. Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software. Design submittal drawings shall be 22x34 size, suitable for half-size scaled reproduction.

2.0 Section 2 – Design Requirements

- 2.1. <u>BIM Model and Facility Data</u>. Contractor shall use BIM application(s) and software(s) to develop project designs. "Facility Data" is defined as associated intelligent attribute data. The "Model" is defined as 3D graphics that includes Facility Data and output as described in the paragraph 'Output' below. Contractors will use the Model to produce accurate Construction Documents. For each Center of Standardization (CoS) facility type included in this project, all BIM Models and associated Facility Data shall be submitted in Bentley Systems BIM [Not Supplied SubmittalReqCADDSystem: BENTLEY_VERSION] with associated USACE Bentley BIM Workspace (which includes specific standard BIM libraries and definitions). This Workspace can be downloaded from the CAD/BIM Technology Center. [Where available, the workspace will be specific to this CoS Facility Standard Design. The Contractor will be provided a baseline multi-discipline BIM Project Model for the CoS Facility Standard Design type, where such a model exists (for the purposes of site adaptation).] The USACE Bentley BIM Workspace is dependent on specific versions of the Bentley BIM suite of products and only the versions of the software that are listed in the Contractor instructions included with the USACE BIM Workspace are permitted to be used.
- 2.1.1. <u>Reference.</u> Refer to ERDC TR-06-10, "U.S. Army Corps of Engineers Building Information Modeling Road Map" from the CAD/BIM Technology Center website for more information on the USACE BIM implementation goals.
- 2.2. <u>Drawings</u>. Deliver CAD files used for the creation of the Construction Documents Drawings per requirements in Section 01 33 16, the criteria of the USACE Fort Worth District, and as noted herein. Specification of a CAD file format for these Drawings does not limit which BIM application(s) or software(s) may be used for project development and execution.
- 2.2.1. <u>IFC Support</u>. The Contractor's selected BIM application(s) and software(s) must support the IFC (Industry Foundation Class see www.iai-tech.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.
- 2.2.2. <u>Submittal Requirements</u>. BIM submittals shall be fully interoperable, compatible, and editable with the Bentley BIM tools. Use the specified version of the USACE Bentley BIM Workspace and conform to the requirements of **Sections 3 and 4 below**.
- 2.2.3. BIM Project Execution Plan.
- 2.2.3.1. Develop a BIM Project Execution Plan ("Plan" or "PxP") documenting the BIM and analysis technologies selected for the Project Model (integrated with the AEC CAD Standard) from concept development through As-Builts as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be executed. See Section 7 for additional guidance on developing the Plan.
- 2.2.4. BIM Requirements..
- 2.2.4.1. <u>Facility Data</u>. Develop the Facility Data consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions and attributes that are necessary for the Project facility design and construction. Additional data in support of Section 6 Contractor Electives is encouraged.

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2.2.4.2. <u>Model Content</u>. The Model and Facility Data shall include, at a minimum, the requirements of Section 4 below.

- 2.2.4.3. <u>Model Granularity</u>. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.
- 2.2.4.4. <u>Output</u>. Submitted CAD drawings (e.g., plans, elevations, sections, schedules, details, etc.) shall be derived (commonly known as extractions, views or sheets) and maintained from the submitted Model and Facility Data.
- 2.3. Quality Control. Implement quality control (QC) parameters for the Model, including:
- 2.3.1. <u>Model Standards Checks</u>. QC validation used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Report non-compliant elements and corrective action plan to correct non-compliant elements. Provide the government with detailed justification and request government approval for any non-compliant element which the contractor proposes to be allowed to remain in the Model.
- 2.3.2. <u>CAD Standards Checks</u>. QC checking performed to ensure that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per the A/E/C CADD Standard.
- 2.3.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.
- 2.4. <u>Design and Construction Reviews.</u> Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:
- 2.4.1. <u>Visual Checks.</u> Checking to ensure the design intent has been followed and that there are no unintended elements in the Model.
- 2.4.2. <u>Interference Management Checks.</u> Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences, (e.g., conflicts regarding equipment clearance, service access, fireproofing, insulation) in a written report and resolve.
- 2.4.3. <u>IFC Coordination View.</u> Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements.
- 2.4.4. <u>Other Parameters.</u> Develop such other Review parameters as the Contractor deems appropriate for the Project and provide to the Government for concurrence..

3.0 Section 3 – Design Stage Submittal Requirements

- 3.1. General Submittal Requirements.
- 3.1.1. Provide submittals in compliance with BIM Project Execution Plan deliverables at stages as described hereinafter.
- 3.1.2. At each Stage in Paragraphs 3.3 through 3.6, provide a Contractor-certified written report confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed. This report shall be discussed as part of the review process and shall address cross-discipline interferences, if any.
- 3.1.3. At each Stage in Paragraphs 3.3 through 3.6, provide the Government with:
- The Model, Facility Data, Workspace and CAD Data files in native Bentley BIM/CAD.
- A 3-D interactive review format of the Model in Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or other format per Plan requirements. The file format for reviews can change between submittals.

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- A list of all submitted files. The list should include a description, directory, and file name for each file submitted. For all CAD sheets, include the sheet title and sheet number. Identify files that have been produced from the submitted Model and Facility Data.

- 3.1.4. The Government will confirm acceptability of all submittals identified in Section 3 in coordination with the USACE Fort Worth BIM Manager
- 3.2. <u>Initial Design Conference Submittal.</u>
- 3.2.1. Submit a digital copy of the Plan where, in addition to Paragraph 3.1.4, the USACE Geographic District BIM Manager will coordinate with the USACE CoS BIM Manager to confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated.
- 3.2.2. Within thirty (30) days after the approval of the Plan, conduct a demonstration to review the Plan for clarification, and to verify the functionality of Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the Plan and perform subsequent demonstration for Government acceptance. There will be no payment for design or construction until the Plan is acceptable to the Government. The Government may also withhold payment for design and construction for unacceptable performance in executing the approved Plan.
- 3.3. Interim Design Submittals.
- 3.3.1. <u>BIM and CAD Data</u>. The Model shall include the requirements identified in Paragraph 2.2.4 as applicable to the Interim Design package(s).
- 3.4. <u>Final Design Submissions and Design Complete Submittals.</u>
- 3.4.1. <u>BIM and CAD Data</u>. The Model shall include the requirements identified in Paragraph 2.2.4. Acceptance according to Paragraph 3.1.4 is required before commencement of construction, as described in Paragraph 3.7.6 of Section 01 33 16.
- 3.5. <u>Construction Submittals Over-The-Shoulder Progress Reviews</u>. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.
- 3.6. <u>Final As-Builts BIM and CAD Data Submittal.</u> Submit the final Model, Facility Data, and CAD files reflecting as-built conditions for Government Approval, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

- 4.1. <u>General Provisions</u>. The deliverable Model shall be developed to include the systems described below as they would be built and the processes of installing them, and to reflect final as-built conditions. The deliverable model at the interim design stage and at the final design stage ("released for construction") shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.
- 4.2. <u>Architectural/Interior Design</u>. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional <u>minimum</u> Model requirements include:
- 4.2.1. <u>Spaces</u>. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities.
- 4.2.2. <u>Walls and Curtain Walls</u>. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

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4.2.3. <u>Doors, Windows and Louvers</u>. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.

- 4.2.4. <u>Roof.</u> The Model shall include the roof configuration, drainage system, penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.
- 4.2.5. <u>Floors</u>. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.
- 4.2.6. <u>Ceilings</u>. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.
- 4.2.7. <u>Vertical Circulation</u>. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.
- 4.2.8. <u>Architectural Specialties and Woodwork.</u> All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.
- 4.2.9. <u>Signage.</u> The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.
- 4.2.10. <u>Schedules</u>. Provide door, window, hardware sets using BHMA designations, flooring, wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.
- 4.3. <u>Furniture.</u> The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing, and have necessary intelligence to produce accurate plans. Representation of furniture elements is to be 2D. Contractor may provide a minimal number of 3D representations as examples. Examples of furniture include, but are not limited to, desks, furniture systems, seating, tables, and office storage.
- 4.3.1. <u>Furniture Coordination</u>. Furniture that makes use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents and data.
- 4.4. <u>Equipment</u>. The Model may vary in level of detail for individual elements within a Model. Equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans and minimum schedules depicting their configuration. Examples of equipment include but are not limited to copiers, printers, refrigerators, ice machines and microwaves.
- 4.4.1. <u>Schedules</u>. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.
- 4.5. <u>Structural</u>. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:
- 4.5.1. <u>Foundations</u>. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations
- 4.5.2. <u>Floor Slabs</u>. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

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4.5.3. <u>Structural Steel</u>. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

- 4.5.4. <u>Cast-in-Place Concrete</u>. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.
- 4.5.5. <u>Expansion/Contraction Joints.</u> Joints shall be accurately depicted.
- 4.5.6. <u>Stairs</u>. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.
- 4.5.7. <u>Shafts and Pits</u>. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.
- 4.6. <u>Mechanical.</u> The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2" NPS) field-routed piping is not required in the model. Additional <u>minimum</u> Model requirements include:
- 4.6.1. <u>HVAC</u>. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules.
- 4.6.1.1. <u>Mechanical Piping</u>. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules.
- 4.6.2. <u>Plumbing</u>. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules.
- 4.6.3. <u>Equipment Clearances</u>. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.
- 4.6.4. <u>Elevator Equipment</u>. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.
- 4.7. <u>Electrical/Telecommunications</u>. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2"Ø) field-routed conduit is not required in the model. Additional minimum Model requirements include:
- 4.7.1. <u>Interior Electrical Power and Lighting.</u> All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, cable trays and control systems), including necessary intelligence to produce accurate plans, details and schedules. Lighting and power built into furniture/equipment shall be modeled.
- 4.7.2. <u>Special Electrical Systems.</u> All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.
- 4.7.3. <u>Grounding Systems.</u> <u>Grounding Systems.</u> All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.

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4.7.4. <u>Communications</u>. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents.

- 4.7.5. <u>Exterior Building Lighting</u>. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.
- 4.7.6. <u>Equipment Clearances</u>. The model shall incorporate and define all electrical and communications working spaces, clearances, and required access
- 4.8. <u>Fire Protection</u>. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional <u>minimum</u> Model requirements include:
- 4.8.1. <u>Fire Protection System.</u> All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.
- 4.8.2. <u>Fire Alarms</u>. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.
- 4.9. <u>Civil</u>. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1"=100') scaled drawing. Additional <u>minimum</u> Model requirements include:
- 4.9.1. <u>Terrain (DTM)</u>. All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.
- 4.9.2. <u>Drainage</u>. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.
- 4.9.3. <u>Storm Water and Sanitary Sewers</u>. All existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.
- 4.9.4. <u>Utilities</u>. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.
- 4.9.5. <u>Roads and Parking</u>. All necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

5.0 Section 5 - Ownership and Rights in Data

5.1. Ownership. The Government has ownership of and rights at the date of Closeout Submittal to all CAD files, BIM Model, and Facility Data developed for the Project in accordance with FAR Part 27, clauses incorporated in Section 00 72 00, Contract Clauses and Special Contract Requirement 1.14 GOVERNMENT RE-USE OF DESIGN (Section 00 73 00). The Government may make use of this data following any deliverable.

6.0 Section 6 - Contractor Electives

6.1. <u>Applicable Criteria.</u> If the Contractor elected to include one or more of the following features as an elective in its accepted contract proposal for additional credit during the source selection, as described in the proposal submission requirements and evaluation criteria, the following criteria are requirements, as applicable to those elective feature(s).

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6.2. <u>COBIE Compliance.</u> The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements as defined by the Whole Building Design Guide organization, including all requirements for the indexing and submission of Portable Document Format (PDF) and other appropriate file formats that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

- 6.3. <u>Project Scheduling using the Model</u>. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of the project construction schedule.
- 6.3.1. <u>Submittal Requirements</u>. During the Submittal stages, the Contractor shall deliver the construction schedule with information derived from the Model.
- 6.3.1.1. <u>Construction Submittals Over-The-Shoulder Progress Reviews</u>. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model for project scheduling.
- 6.4. <u>Cost Estimating.</u> In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of cost estimating requirements, or other applications such as cost analysis and estimate validation.
- 6.4.1. <u>Submittal Requirements</u>. During the Submittal stages, the Contractor shall deliver cost estimating information derived from the Model.
- 6.4.2. <u>Project completion</u>. At project completion, the Contractor shall provide an MII (Micro Computer Aided Cost Estimating System Generation II) Cost Estimate which follows the USACE Cost Engineering Military Work Breakdown System (WBS), a modified Uniformat, to at least the sub-systems level and uses quantity information supplied directly from BIM output to the maximum extent possible, though other "Gap" quantity information will be included as necessary for a complete and accurate cost estimate.
- 6.4.2.1. Sub system level extracted quantities from the BIM for use within the estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done on the first floor versus the same task on higher floors that will be more labor intensive and therefore need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the BIM shall be broken done by their location (proximity in the structure) as well as the complexity of its installation.
- 6.4.2.2. At all design stages it shall be understood that BIM output as described in this document will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the project based on the design. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.
- 6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing.

7.0 Section 7 – BIM Project Execution Plan Template

7.1. Contractors will utilize the latest version of the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template to develop an acceptable Plan. The template can be downloaded from the CAD/BIM Technology Center website.

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Section: 01 33 16

ATTACHMENT G DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

Organize electronic design submittal files in a subdirectory/file structure in accordance with the following table.

The Contractor may suggest a slightly different structure, subject to the discretion of the government.

Design Submittal Directory and Subdirectory File Arrangement.

Directory	Sub-Directory	Sub-Directory or Files	Files
Submittal/Package	Narratives	PDF file or files with updated design	
Name		narrative for each applicable design	
		discipline	
	Drawings	PDF (subdirectory)	Single PDF file with all
		,	applicable drawing sheets -
			bookmarked by sheet
			number and name
		BIM (subdirectory) See Attachment F.	BIM project folder (with
			files) per the USACE
			Workspace. Include an
			Excel drawing index file with
			each drawing sheet listed
			by sheet #, name and
			corresponding dgn file
			name (Final Design &
		1 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Design Complete only)
	Design Analysis &	Individual PDF files containing design	
	Calculations	analysis and calculations for each	
		discipline applicable to the submittal	
		PDF file with Fire Protection and Life	
	LEED	Safety Code Review checklist	
	LEED	PDF file with updated Leed Check List	
		PDF file or files with LEED Templates for each point with applicable	
		documentation included in each file.	
		LEED SUBMITTALS	
	Energy Analysis	PDF with baseline energy consumption	
	Lifergy Allalysis	analysis	
		PDF with actual building energy	
		consumption analysis	
	Specifications	Single PDF file with table of contents	
		and all applicable specifications	
		sections.	
		Submittal Register (Final Design &	
		Design Complete submittal only)	
	Design Quality	PDF file or files with DQC checklist(s)	
	Control	and/or statements	
	Building	PDF file of rendering for each building	
	Rendering(s)	type included in contract (Final Design	
		& Design Complete).	

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SECTION 01 45 01.10 QUALITY CONTROL SYSTEM (QCS)

1.0 GENERAL

- 1.1. CORRESPONDENCE AND ELECTRONIC COMMUNICATIONS
- 1.2. QCS SOFTWARE
- 1.3. SYSTEM REQUIREMENTS
- 1.4. RELATED INFORMATION
- 1.5. CONTRACT DATABASE
- 1.6. DATABASE MAINTENANCE
- 1.7. IMPLEMENTATION
- 1.8. DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM
- 1.9. MONTHLY COORDINATION MEETING
- 1.10. NOTIFICATION OF NONCOMPLIANCE

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1.0 GENERAL

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. The Contractor module, user manuals, updates, and training information can be downloaded from the RMS web site. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

- Administration
- Finances
- Quality Control
- Submittal Monitoring
- Scheduling
- Import/Export of Data
- Request for Information
- Accident Reporting
- Safety Exposure Manhours

1.1. CORRESPONDENCE AND ELECTRONIC COMMUNICATIONS

For ease and speed of communications, both Government and Contractor will exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.2. OTHER FACTORS

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01 32 01.00 10, PROJECT SCHEDULE, Section 01 33 00, SUBMITTAL PROCEDURES, and Section 01 45 04.00 10, CONTRACTOR QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith shall be included in the contract pricing for the work.

1.3. QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor shall be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide QCS on CD-ROM. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

1.4. SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:

(a) Hardware

- IBM-compatible PC with 1000 MHz Pentium or higher processor
- 256 MB RAM for workstation / 512+ MB RAM for server
- 1 GB hard drive disk space for sole use by the QCS system
- Compact disk (CD) Reader, 8x speed or higher
- SVGA or higher resolution monitor (1024 x 768, 256 colors)
- Mouse or other pointing devise
- Windows compatible printer (Laser printer must have 4+ MB of RAM)
- Connection to the Internet, minimum 56K BPS

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(b) Software

- MS Windows 2000 or higher
- MS Word 2000 or newer
- Latest version of: Netscape Navigator, Microsoft Internet Explorer, or other browser that supports HTML
 4.0 or higher
- Electronic mail (E-mail), MAPI compatible
- Virus protection software that is regularly upgraded with all issued manufacturer's updates

1.5. RELATED INFORMATION

1.5.1. QCS USER GUIDE

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.5.2. CONTRACTOR QUALITY CONTROL (CQC) TRAINING

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class.

1.6. CONTRACT DATABASE

Prior to the pre-construction conference, the Government will provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by using the government's SFTP repository built into QCS import/export function. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.7. DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the contract in the QCS database throughout the duration of the contract. The Contractor shall establish and maintain the QCS database at the Contractor's site office. Data updates to the Government, e.g., daily reports, submittals, RFI's, schedule updates, payment requests, etc. shall be submitted using the government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, email or CD-ROM may be used instead (see Paragraph DATA SUBMISSION VIA CD-ROM). The QCS database typically shall include current data on the following items:

1.7.1. ADMINISTRATION

1.7.1.1. Contractor Information

The database shall contain the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver Contractor administrative data in electronic format.

1.7.1.2. Subcontractor Information

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format.

1.7.1.3. Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main)

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office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

All Requests For Information (RFI) shall be exchanged using the Built-in RFI generator and tracker in QCS.

1.7.1.4. Equipment

The Contractor's QCS database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.7.1.5. Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.7.2. FINANCES

1.7.2.1. Pay Activity Data

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the design and construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.7.2.2. Payment Requests

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet prompt payment certification, and payment invoice in QCS. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. The Contractor shall submit the payment request, prompt payment certification, and payment invoice with supporting data by using the government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, E-mail or a CD-ROM may be used. A signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

1.7.3. Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 04.00 10, CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall submit a QCS update reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.7.3.1. Daily Contractor Quality Control (CQC) Reports

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by Section 01 45 04.00 10, CONTRACTOR QUALITY CONTROL. Reports shall be submitted electronically to the Government within 24 hours after the date covered by the report. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

1.7.3.2. Deficiency Tracking

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The Contractor shall use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of both QC and QA punch list items.

1.7.3.3. QC Requirements

The Contractor shall develop and maintain a complete list of QC testing and required structural and life safety special inspections required by the International Code Council (ICC), transferred and installed property, and user training requirements in QCS. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

1.7.3.4. Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.7.3.5. Labor and Equipment Hours

The Contractor shall log labor and equipment exposure hours on a daily basis. This data will be rolled up into a monthly exposure report.

1.7.3.6. Accident/Safety Tracking Reporting

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This supplemental entry is not to be considered as a substitute for completion of mandatory notification and reports, e.g., ENG Form 3394 and OSHA Form 300.

1.7.3.7. Features of Work

The Contractor shall include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.7.3.8. Hazard Analysis

The Contractor shall use QCS to develop a hazard analysis for each feature of work included in its CQC Plan. The hazard analysis shall address any hazards, or potential hazards, that may be associated with the work

1.7.4. Submittal Management

The Government will provide the submittal register form, ENG Form 4288, SUBMITTAL REGISTER, in electronic format. The Contractor and Designer of Record (DOR) shall develop and maintain a complete list of all submittals, including completion of all data columns and shall manage all submittals. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using QCS. QCS and RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.7.5. Schedule

The Contractor shall develop a design and construction schedule consisting of pay activities, in accordance with Section 01 32 01.00 10, PROJECT SCHEDULE, as applicable. This schedule shall be input and maintained in the QCS database either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01 32 01.00 10 PROJECT SCHEDULE). The updated schedule data shall be included with each pay request submitted by the Contractor.

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1.7.5.1. Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data from RMS, and schedule data using SDEF.

1.8. IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

1.9. DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

The Government-preferred method for Contractor's submission of QCS data is by using the government's SFTP repository built into QCS export function.. Other data should be submitted using E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of CD-ROM for data transfer. Data on CDs shall be exported using the QCS built-in export function. If used, CD-ROMs will be submitted in accordance with the following:

1.9.1. File Medium

The Contractor shall submit required data on CD-ROMs. They shall conform to industry standards used in the United States. All data shall be provided in English.

1.9.2. Disk Or Cd-Rom Labels

The Contractor shall affix a permanent exterior label to each diskette and CD-ROM submitted. The label shall indicate in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

1.9.3. File Names

The files will be automatically named by the QCS software. The naming convention established by the QCS software shall not be altered in any way by the Contractor.

1.10. MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions.

The Contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.11. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

End of Section 01 45 01.10

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SECTION 01 45 04.00 10 CONTRACTOR QUALITY CONTROL

1.	0	GENERAL
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- 1.1. REFERENCES
- 1.2. PAYMENT
- 2.0 PRODUCTS (NOT APPLICABLE)
- 3.0 EXECUTION
- 3.1. GENERAL REQUIREMENTS
- 3.2. QUALITY CONTROL PLAN
- 3.3. COORDINATION MEETING
- 3.4. QUALITY CONTROL ORGANIZATION
- 3.5. SUBMITTALS AND DELIVERABLES
- 3.6. CONTROL
- 3.7. TESTS
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- 3.10. NOTIFICATION OF NONCOMPLIANCE

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1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Refer to the latest edition, as of the date of the contract solicitation.

- ASTM INTERNATIONAL (ASTM)
- ASTM D 3740 Minimum Requirements for Agencies

Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

- ASTM E 329 Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
- U.S. ARMY CORPS OF ENGINEERS (USACE)
 ER 1110-1-12 Quality Management

1.2. PAYMENT

There will be no separate payment for providing and maintaining an effective Quality Control program. Include all costs associated therewith in the applicable unit prices or lump-sum prices contained in the Contract Line Item Schedule.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product, which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed design and construction sequence. The site project superintendent is responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2. QUALITY CONTROL PLAN

Furnish for Government review, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Design and construction may begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. The Government will not permit work outside of the features of work included in an accepted interim plan to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started. Where the applicable Code issued by the International Code Council calls for an inspection by the Building Official, the Contractor shall include the inspections in the Quality Control Plan and shall perform the inspections. The Designer of Record shall develop a program for any special inspections required by the applicable International Codes and the Contractor shall perform these inspections, using qualified inspectors. Include the special inspection plan in the QC Plan.

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3.2.1. Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

- 3.2.1.1. A description of the quality control organization. Include a chart showing lines of authority and an acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. A CQC System Manager shall report to the project superintendent or someone higher in the contractor's organization.
- 3.2.1.2. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Also include those responsible for performing and documenting the inspections required by the International Codes and the special inspection program developed by the designer of record.
- 3.2.1.3. A copy of the letter to the CQC System Manager, signed by an authorized official of the firm, which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Furnish copies of these letters.
- 3.2.1.4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.
- 3.2.1.5. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Use only Government approved Laboratory facilities.
- 3.2.1.6. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- 3.2.1.7. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
- 3.2.1.8. Reporting procedures, including proposed reporting formats.
- 3.2.1.9. A list of the definable features of work. A definable feature of work is a task, which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.
- 3.2.1.10. A list of all inspections required by the International Codes and the special inspection program required by the code and this contract.
- 3.2.2. Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

3.2.2.1. The Contractor's QCP Plan shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, competent, independent reviewers identified in the DQC Plan shall review all documents. Use personnel who were not involved in the design effort to produce the design to perform the independent technical review (ITR). The ITR is intended as a quality control check of the design. Include, at least, but not necessarily limited to, a review of the contract requirements (the accepted contract or task order proposal and amended RFP), the basis of design, design calculations, the design configuration management documentation and check the design documents for

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errors, omissions, and for coordination and design integration. The ITR team is not required to examine, compare or comment concerning alternate design solutions but should concentrate on ensuring that the design meets the contract requirements. Correct errors and deficiencies in the design documents prior to submitting them to the Government.

- 3.2.2.2. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists at each design phase as part of the project documentation.
- 3.2.2.3. A Design Quality Control Manager, who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated, shall implement the DQC Plan This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Government, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

3.2.3. Acceptance of Plan

Government acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4. Notification of Changes

After acceptance of the CQC Plan, notify the Government in writing of any proposed change. Proposed changes are subject to Government acceptance.

3.3. COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, the Contractor and the Government shall meet and discuss the Contractor's quality control system. Submit the CQC Plan for review a minimum of 7 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. The Government will prepare minutes of the meeting for signature by both parties. The minutes shall become a part of the contract file. There may be occasions when either party will call for subsequent conferences to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4. QUALITY CONTROL ORGANIZATION

3.4.1. Personnel Requirements

The requirements for the CQC organization are a CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure contract compliance. The CQC organization shall also include personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly furnish complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2. CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System

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Manager shall be a graduate engineer, graduate architect, or a BA/BS graduate of an ACCE accredited construction management college program. The CQC system Manager may alternately be an engineering technician with at least 2 years of college and an ICC certification as a Commercial Building Inspector (Residential Building Inspector certification will be required for Military Family Housing projects). In addition, the CQC system manager shall have a minimum of 5 years construction experience on construction similar to this contract. The CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. Assign the CQC System Manager no other duties (except may also serve as Safety and Health Officer, if qualified and if allowed by Section 00 73 00). Identify an alternate for the CQC System Manager in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager but the alternate may have other duties in addition to serving in a temporary capacity as the acting QC manager.

- 3.4.3. CQC Personnel
- 3.4.3.1. In addition to CQC personnel specified elsewhere in the contract provide specialized CQC personnel to assist the CQC System Manager in accordance with paragraph titled Area Qualifications.
- 3.4.3.2. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; are not intended to be full time, but must be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. One person may cover more than one area, provided that they are qualified to perform QC activities for the designated areas below and provided that they have adequate time to perform their duties:
- 3.4.4. Experience Matrix
- 3.4.4.1. Area Qualifications
- 3.4.4.1.1. Civil Graduate Civil Engineer or (BA/BS) graduate in construction management with 4 years experience in the type of work being performed on this project or engineering technician with 5 yrs related experience.
- 3.4.4.1.2. Mechanical Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Mechanical Inspector with 5 yrs related experience.
- 3.4.4.1.3. Electrical Graduate Electrical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Electrical Inspector with 5 yrs related experience.
- 3.4.4.1.4. Structural Graduate Structural Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or person with an ICC certification as a Reinforced Concrete Special Inspector and Structural Steel and Bolting Special Inspector (as applicable to the type of construction involved) with 5 yrs related experience.
- 3.4.4.1.5. Plumbing Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience, or person with an ICC certification as a Commercial Plumbing Inspector with 5 yrs related experience.
- 3.4.4.1.6. Concrete, Pavements and Soils Materials Technician (present while performing tests) with 2 yrs experience for the appropriate area
- 3.4.4.1.7. Testing, Adjusting and Balancing Specialist must be a member (TAB) Personnel of AABC or an experienced technician of the firm certified by the NEBB (present while testing, adjusting, balancing).
- 3.4.4.1.8. Design Quality Control Manager Registered Architect or Professional Engineer (not required on the construction site)

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3.4.4.1.9. Registered Fire Protection Engineer with 4 years related experience or engineering technician with 5 yrs related experience (but see requirements for Fire Protection Engineer of Record to witness final testing in Section 01 10 00, paragraph 5.10, Fire Protection).

3.4.4.1.10. QC personnel assigned to the installation of the telecommunication system or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification. In lieu of BICSI certification, QC personnel shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products. QC personnel shall witness and certify the testing of telecommunications cabling and equipment.

3.4.5. Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management for Contractors". This course is periodically offered at Corps of Engineers, Seattle District. Inquire of the District or Division sponsoring the course for fees and other expenses involved, if any, for attendance at this course.

3.4.6. Organizational Changes

When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5. SUBMITTALS AND DELIVERABLES

Make submittals as specified in Section 01 33 00 **SUBMITTAL PROCEDURES**. The CQC organization shall certify that all submittals and deliverables are in compliance with the contract requirements.

3.6. CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The CQC organization shall conduct at least three phases of control for each definable feature of the construction work as follows:

3.6.1. Preparatory Phase

Perform this phase prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

- 3.6.1.1. A review of each paragraph of applicable specifications, reference codes, and standards. Make a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field at the preparatory inspection. Maintain these copies in the field, available for use by Government personnel until final acceptance of the work.
- 3.6.1.2. A review of the contract drawings.
- 3.6.1.3. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- 3.6.1.4. Review of provisions that have been made to provide required control inspection and testing.
- 3.6.1.5. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- 3.6.1.6. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- 3.6.1.7. A review of the appropriate activity hazard analysis to assure safety requirements are met.

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3.6.1.8. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

- 3.6.1.9. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- 3.6.1.10. Discussion of the initial control phase.
- 3.6.1.11. Notify the Government at least 24 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2. Initial Phase

Accomplish this phase at the beginning of a definable feature of work. Include the following actions:

- 3.6.2.1. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- 3.6.2.2. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- 3.6.2.3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- 3.6.2.4. Resolve all differences.
- 3.6.2.5. Check safety to include compliance with and upgrading of the Accident Prevention plan and activity hazard analysis. Review the activity analysis with each worker.
- 3.6.2.6. Notify the Government at least 24 hours in advance of beginning the initial phase. The CQC System Manager shall prepare and attach to the daily CQC report separate minutes of this phase. Indicate exact location of initial phase for future reference and comparison with follow-up phases.
- 3.6.2.7. Repeat the initial phase any time acceptable specified quality standards are not being met.

3.6.3. Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Conduct final follow-up checks and correct deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4. Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7. TESTS

3.7.1. Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements and project design documents. Upon request, furnish to the Government

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duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory, or establish an approved testing laboratory at the project site. The Contractor may elect to use a laboratory certified and accredited by the Concrete and cement Reference Laboratory (CCRL) or by AASHTO Materials Reference Laboratory (AMRL) for testing procedures that those organizations certify. The Contractor shall perform the following activities and record and provide the following data:

- 3.7.1.1. Verify that testing procedures comply with contract requirements and project design documents.
- 3.7.1.2. Verify that facilities and testing equipment are available and comply with testing standards.
- 3.7.1.3. Check test instrument calibration data against certified standards.
- 3.7.1.4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- 3.7.1.5. Include results of all tests taken, both passing and failing tests, recorded on the CQC report for the date taken. Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.
- 3.7.2. Testing Laboratories
- 3.7.2.1. Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2. Capability Recheck

If the selected laboratory fails the capability check, the Government will assess the Contractor a charge of \$1,375 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3. Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4. Furnishing or Transportation of Samples for Government Quality Assurance Testing

The Contractor is responsible for costs incidental to the transportation of samples or materials. Deliver samples of materials for test verification and acceptance testing by the Government to the Corps of Engineers Laboratory, f.o.b., at the following address:

For delivery by mail:

Area Office designated Government-contract laboratory

N/A

N/A

N/A

For other deliveries:

Area Office designated Government-contract laboratory

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N/A

N/A

N/A

The area or resident office will coordinate, exact delivery location, and dates for each specific test.

3.8. COMPLETION INSPECTION

3.8.1. Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. Prepare a punch list of items which do not conform to the approved drawings and specifications and include in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2. Pre-Final Inspection

As soon as practicable after the notification above, the Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. Accomplish these inspections and any deficiency corrections required by this paragraph within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3. Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall attend the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups and major commands may also attend. The Government will formally schedule the final acceptance inspection based upon results of the Pre-Final inspection. Provide notice to the Government at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9. DOCUMENTATION

- 3.9.1. Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers using government-provided software, QCS (see Section 01 45 01.10). The report includes, as a minimum, the following information:
- 3.9.1.1. Contractor/subcontractor and their area of responsibility.
- 3.9.1.2. Operating plant/equipment with hours worked, idle, or down for repair.
- 3.9.1.3. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

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3.9.1.4. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the applicable control phase (Preparatory, Initial, Follow-up). List deficiencies noted, along with corrective action.

- 3.9.1.5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- 3.9.1.6. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- 3.9.1.7. Offsite surveillance activities, including actions taken.
- 3.9.1.8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- 3.9.1.9. Instructions given/received and conflicts in plans and/or specifications.
- 3.9.1.10. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identity of the ITR team, the ITR review comments, responses and the record of resolution of the comments.
- 3.9.2. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, submit one report for every 7 days of no work and on the last day of a no work period. Account for all calendar days throughout the life of the contract. The first report following a day of no work shall be for that day only. The CQC System Manager shall sign and date reports. The report shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. The Contractor may submit these forms electronically, in lieu of hard copy.

3.10. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

End of Section 01 45 04.00 10

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SECTION 01 50 02 TEMPORARY CONSTRUCTION FACILITIES

1.0 OVERVIEW

- 1.1. GENERAL REQUIREMENTS
- 1.2. AVAILABILITY AND USE OF UTILITY SERVICES
- 1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN
- 1.4. PROTECTION AND MAINTENANCE OF TRAFFIC
- 1.5. MAINTENANCE OF CONSTRUCTION SITE
- 1.6. GOVERNMENT FIELD OFFICE

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1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.1.1. Site Plan

Prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Also indicate if the use of a supplemental or other staging area is desired.

1.2. AVAILABILITY AND USE OF UTILITY SERVICES

1.2.1. See Section 00 72 00, Contract Clauses and Section 00 73 00, Special Contract Requirements, for Utility Availability requirements.

1.2.2. Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer. Government toilet facilities will not be available to Contractor's personnel.

1.2.3. Telephone

Make arrangements and pay all costs for desired telephone facilities.

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1. Bulletin Board

Immediately upon beginning of onsite work, provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Display legible copies of the aforementioned data until work is completed. Remove the bulletin board from the site upon completion of the project.

1.3.2. Project and Safety Signs

Erect a project sign and a site safety sign with informational details as provided by the Government at the Post award conference, within 15 days prior to any work activity on project site. Update the safety sign data daily, with light colored metallic or non-metallic numerals. Remove the signs from the site upon completion of the project. Engineer Pamphlet EP 310-1-6a contains the standardized layout and construction details for the signs. It can be found through a GOOGLE Search or try http://www.usace.army.mil/publications/eng-pamphlets/ep310-1-6a/s-16.pdf.

1.4. PROTECTION AND MAINTENANCE OF TRAFFIC

Provide access and temporary relocated roads as necessary to maintain traffic. Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Take measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property.

The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. Investigate the adequacy of existing roads and the allowable load limit on these roads. Repair any damage to roads caused by construction operations.

1.4.1. Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Construct haul roads with suitable grades and widths. Avoid sharp curves, blind corners, and dangerous cross traffic. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Provide adequate lighting to assure full and clear visibility for full width of haul road and work areas during any night work operations. Remove haul roads designated by the Contracting Officer upon completion of the work and restore those areas.

1.4.2. Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.5. MAINTENANCE OF CONSTRUCTION SITE

Mow grass and vegetation located within the boundaries of the construction site for the duration of the project, from NTP to contract completion. Edge or neatly trim grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers from NTP to contract completion.

1.6. GOVERNMENT FIELD OFFICE

1.6.1. Resident Engineer's Office

Provide the Government Resident Engineer with an office, approximately 200 square feet in floor area, co-located on the project site with the Contractor's office and providing space heat, air conditioning, electric light and power, power and communications outlets and toilet facilities consisting of at least one lavatory and at least one water closet complete with connections to water and sewer mains. Provide a mail slot in the door or a lockable mail box mounted on the surface of the door. Provide outlets for 2 government phones and same number of LAN connections for Government computers. Coordinate with the Resident Engineer for locations. Provide a conference room with space large enough for 6 personnel to hold meetings. Provide a minimum of two outlets per government work station and at least one outlet per 10 feet of wall space for other government equipment. Provide at least twice weekly janitorial service. Remove the office facilities upon completion of the work and restore those areas. Connect and disconnect utilities in accordance with local codes and to the satisfaction of the Contracting Officer.

1.6.2. Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above Securely anchor the trailer to the ground at all four corners to guard against movement during high winds, per EM 385-1-1.

End of Section 01 50 02

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SECTION 01 57 20.00 10 ENVIRONMENTAL PROTECTION

1.0 GENERAL REQUIREMENTS

- 1.1. SUBCONTRACTORS
- 1.2. ENVIRONMENTAL PROTECTION PLAN
- 1.3. PROTECTION FEATURES
- 1.4. ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS
- 1.5. NOTIFICATION
- 2.0 PRODUCTS (NOT USED)
- 3.0 EXECUTION
- 3.1. LAND RESOURCES
- 3.2. WATER RESOURCES
- 3.3. AIR RESOURCES
- 3.4. CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL
- 3.5. RECYCLING AND WASTE MINIMIZATION
- 3.6. HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES
- 3.7. BIOLOGICAL RESOURCES
- 3.8. INTEGRATED PEST MANAGEMENT
- 3.9. PREVIOUSLY USED EQUIPMENT
- 3.10. MILITARY MUNITIONS
- 3.11. TRAINING OF CONTRACTOR PERSONNEL
- 3.12. POST CONSTRUCTION CLEANUP

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1.0 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations

1.1. SUBCONTRACTORS

Ensure compliance with this section by subcontractors.

1.2. ENVIRONMENTAL PROTECTION PLAN

1.2.1. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Define issues of concern within the Environmental Protection Plan as outlined in this section. Address each topic in the plan at a level of detail commensurate with the environmental issue and required construction task(s). Identify and discuss topics or issues which are not identified in this section, but which the Contractor considers necessary, after those items formally identified in this section. Prior to commencing construction activities or delivery of materials to the site, submit the Plan for review and Government approval. The Contractor shall meet with the Government prior to implementation of the Environmental Protection Plan, for the purpose of discussing the implementation of the initial plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. Maintain and keep the Environmental Protection Plan current onsite.

1.2.2. Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.2.3. Contents

The plan shall include, but shall not be limited to, the following:

- 1.2.3.1. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- 1.2.3.2. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable
- 1.2.3.3. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel
- 1.2.3.4. Description of the Contractor's environmental protection personnel training program
- 1.2.3.5. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. Include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.
- 1.2.3.6. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site

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1.2.3.7. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Include measures to minimize the amount of mud transported onto paved public

- 1.2.3.8. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
- 1.2.3.9. Drawing showing the location of on-installation borrow areas.

roads by vehicles or runoff.

- 1.2.3.10. A spill control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The spill control plan supplements the requirements of EM 385-1-1. This plan shall include as a minimum:
- (a) The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Government and the local Fire Department in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.
- (b) The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup
- (c) Training requirements for Contractor's personnel and methods of accomplishing the training
- (d) A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
- (e) The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency
- (f) The methods and procedures to be used for expeditious contaminant cleanup
- 1.2.3.11. A solid waste management plan identifying waste minimization, collection, and disposals methods, waste streams (type and quantity), and locations for solid waste diversion/disposal including clearing debris and C&D waste that is diverted (salvaged, reused, or recycled). Detail the contractor's actions to comply with, and to participate in, Federal, state, regional, local government, and installation sponsored recycling programs to reduce the volume of solid waste at the source. Identify any subcontractors responsible for the transportation, salvage and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility. Attach evidence of the facility's ability to accept the solid waste to this plan. A construction and demolition waste management plan, similar to the plan specified in the UFGS 01 74 19 (formerly 01572) may be used as the non-hazardous solid waste management plan. Provide a Non-Hazardous Solid Waste Diversion Report. Submit the report on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and each quarter thereafter (e.g. the first working day of January, April, July, and October) until the end of the project. Additionally, a summary report, with all data fields, is required at the end of the project. The report shall indicate the total type and amount of waste generated, total type and amount of waste diverted. type and amount of waste sent to waste-to-energy facility and alternative daily cover, in tons along with the percent that was diverted. Maintain, track and report construction and demolition waste data in a manner such that the installation can enter the data into the Army SWAR database, which separates data by type of material. A cumulative report in LEED Letter Template format may be used but must be modified to include the date disposed of/diverted and include the above stated diversion data. NOTE: The Solid Waste Diversion Reports are separate documentation than the LEED documentation.

1.2.3.12. DELETED.

- 1.2.3.13. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.
- 1.2.3.14. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of

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these materials. In accordance with EM 385-1-1, include a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time in the contaminant prevention plan. Update the plan as new hazardous materials are brought on site or removed from the site. Reference this plan in the storm water pollution prevention plan, as applicable.

- 1.2.3.15. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented and any required permits. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, include documentation that the waste water treatment plant Operator has approved the flow rate, volume, and type of discharge.
- 1.2.3.16. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Government.
- 1.2.3.17. A pesticide treatment plan, updated, as information becomes available. Include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation specific requirements. Follow AR 200-1, Chapter 5, Pest Management, Section 5-4, "Program Requirements" for data required to be reported to the Installation.

1.3. PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Government shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. Both the Contractor and the Government will sign this survey, upon mutual agreement as to its accuracy and completeness. The Contractor develop a plan that depicts how it will protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.4. ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Government and may require an extended review, processing, and approval time. The Government reserves the right to disapprove alternate methods, even if they are more cost effective, if the Government determines that the proposed alternate method will have an adverse environmental impact.

1.5. NOTIFICATION

The Government will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Government of the proposed corrective action and take such action when approved by the Government. The Government may issue an order stopping all or part of the

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work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Government may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

2.0 PRODUCTS (NOT USED)

3.0 EXECUTION

3.1. LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. Do not attach or fasten any ropes, cables, or guys to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Remove all stone, soil, or other materials displaced into uncleared areas..

3.1.1. Work Area Limits

Prior to commencing construction activities, mark the areas that need not be disturbed under this contract. Mark or fence isolated areas within the general work area which are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. Personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.1.2. Landscape

Clearly identify trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved by marking, fencing, or wrapping with boards, or any other approved techniques. Restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.1.3. Erosion and Sediment Controls

Provide erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. Coordinate with approving authorities (federal, state, etc.) for specific requirements to be included in the plan. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. Keep the area of bare soil exposed at any one time by construction operations to a minimum necessary. Construct or install temporary and permanent erosion and sediment control best management practices (BMPs). BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Remove any temporary measures after the area has been stabilized.

3.1.4. Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Government. Make only approved temporary movement or relocation of Contractor facilities. Provide erosion and sediment controls for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant and/or work areas to protect adjacent areas.

3.2. WATER RESOURCES

Monitor construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation unless otherwise indicated. Monitor all water areas affected by construction activities. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by state or federally issued Clean Water Act permits.

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3.2.1. Stream Crossings

Stream crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments or impede state-designated flows.

3.2.2. Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.3. AIR RESOURCES

Comply with all Federal and State air emission and performance laws and standards for equipment operation, activities, or processes.

3.3.1. Particulates

Control dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants, including weekends, holidays and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods are permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with all State and local visibility regulations.

3.3.2. Odors

Control odors from construction activities at all times. Odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.3.3. Sound Intrusions

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the state and Installation rules.

3.3.4. Burning

Burning is not allowed on the project site unless specified in other sections of the specifications or by written authorization. Specific times, locations, and manners of burning shall be subject to approval.

3.4. CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.4.1. Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Conduct handling, storage, and disposal to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste. Transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. The minimum acceptable off-site solid waste disposal option is a Subtitle D RCRA permitted landfill. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.4.2. Chemicals and Chemical Wastes

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Dispense chemicals, ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. The Government may periodically review this documentation. Collect chemical waste in corrosion resistant, compatible containers. Monitor and remove collection drums to a staging or storage area when contents are within 6 inches of the top. Classify, manage, store, and dispose of wastes in accordance with Federal, State, and local laws and regulations.

3.4.3. Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable state and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, manage and store hazardous waste in compliance with 40 CFR 262. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes; protect it from the weather by placing it in a safe covered location and take precautionary measures, such as berming or other appropriate measures, against accidental spillage. Store, describe, package, label, mark, and placard hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, state, and local laws and regulations. Transport Contractor generated hazardous waste off Government property in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Immediately report spills of hazardous or toxic materials to the Government and the Facility Environmental Office. Contractor will be responsible for cleanup and cleanup costs due to spills. Contractor is responsible for the disposition of Contractor generated hazardous waste and excess hazardous materials.

3.4.4. Fuel and Lubricants

Conduct storage, fueling and lubrication of equipment and motor vehicles in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations.

3.5. RECYCLING AND WASTE MINIMIZATION

Participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project. Line and berm fueling areas and establish storm water control structures at discharge points for site run-off. Keep a liquid containment clean-up kit available at the fueling area.

3.6. HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Existing historical, archaeological, and cultural resources within the Contractor's work area are shown on the drawings. Protect and preserve these resources during the life of the Contract. Temporarily suspend all activities that may damage or alter such resources, if any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found during excavation or other construction activities. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, notify the Government so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.7. BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitat. Protect threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.8. INTEGRATED PEST MANAGEMENT

Coordinate, through the Government, with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application, in order to minimize impacts to existing fauna and flora. Discuss

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integrated pest management strategies with the IPMC and receive concurrence from the IPMC, through the COR, prior to the application of any pesticide associated with these specifications. Give IMPC personnel the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.8.1. Pesticide Delivery and Storage

Deliver pesticides, approved for use on the Installation, to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses.

3.8.2. Qualifications

Use the services of a subcontractor for pesticide application whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.8.3. Pesticide Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions.

3.8.4. Application

A state certified pesticide applicator shall apply pesticides in accordance with EPA label restrictions and recommendations.

3.9. PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing it onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements.

3.10. MILITARY MUNITIONS

Immediately stop work in that area and immediately inform the Government, in the event military munitions, as defined in 40 CFR 260, are discovered or uncovered.

3.11. TRAINING OF CONTRACTOR PERSONNEL

Train personnel in all phases of environmental protection and pollution control. Conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Conduct additional meetings for new personnel and when site conditions change. The training and meeting agenda shall include methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.12. POST CONSTRUCTION CLEANUP

Clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade, fill and seed the entire disturbed area, unless otherwise indicated.

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SECTION 01 62 35 RECYCLED/RECOVERED MATERIAL

- 1.0 GENERAL
- 1.1. REFERENCES
- 1.2. OBJECTIVES
- 1.3. EPA DESIGNATED ITEMS INCORPORATED IN THE WORK
- 1.4. EPA PROPOSED ITEMS INCORPORATED IN THE WORK
- 1.5. EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

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1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

- U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
- 40 CFR 247 Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2. OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

1.3. EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Materials that have been designated by EPA as being products which are or can be made with recovered or recycled materials, when incorporated into the work under this contract, shall contain at least the minimum percentage of recycled or recovered materials indicated by EPA unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4. EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.

1.5. EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be use by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

End of Section 01 62 35

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SECTION 01 78 02.00 10 CLOSEOUT SUBMITTALS

- 1.0 OVERVIEW
- 1.1. SUBMITTALS
- 1.2. PROJECT RECORD DOCUMENTS
- 1.3. EQUIPMENT DATA
- 1.4. CONSTRUCTION WARRANTY MANAGEMENT
- 1.5. MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING
- 1.6. OPERATION AND MAINTENANCE MANUALS
- 1.7. FIELD TRAINING
- 1.8. PRICING OF CONTRACTOR-FURNISHED AND INSTALLED PROPERTY AND GOVERNMENT-FURNISHED CONTRACTOR-INSTALLED PROPERTY
- 1.9. LEED REVIEW MEETINGS
- 1.10. RED ZONE MEETING
- 1.11. FINAL CLEANING
- 1.12. INTERIM FORM DD1354 "TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY

EXHIBIT 1 SAMPLE RED ZONE MEETING CHECKLIST

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1.0 OVERVIEW

1.1. SUBMITTALS

Government approval is required for any submittals with a "G" designation; submittals not having a "G" designation are for Designer of Record approval or for information only. Submit the following in accordance with Section 01 33 00 submittals:

SD-02 Shop Drawings

- As-Built Drawings G
- Drawings showing final as-built conditions of the project. Provide electronic drawing files as specified in Section 01 33 16, 3 sets of blue-line prints and one set of the approved working as-built drawings.

SD-03 Product Data

- As-Built Record of Equipment and Materials
- Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.
- Construction Warranty Management Plan
- Three sets of the construction warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.
- Warranty Tags
- Two record copies of the warranty tags showing the layout and design.
- Final Cleaning
- Two copies of the listing of completed final clean-up items.

1.2. PROJECT RECORD DOCUMENTS

1.2.1. As-Built Drawings - G

An as-built drawing is a construction drawing revised to reflect the final as-built conditions of the project as a result of modifications and corrections to the project design required during construction. The final as-built drawings shall not have the appearance of marked up drawings, but that of professionally prepared drawings as if they were the "as designed" drawings.

1.2.2. Maintenance of As-Built Drawings

- 1.2.2.1. The Configuration Management Plan shall describe how the Contractor will maintain up-to-date drawings, how it will control and designate revisions to the drawings and specifications (In accordance with Special Contract Requirement: **Deviating from the Accepted Design** and Section 01 33 16: **Design after Award**, the Designer of Record's approval is necessary for any revisions to the accepted design).
- 1.2.2.2. Make timely updates, carefully maintaining a record set of working as-built drawings at the job site, marked in red, of all changes and corrections from the construction drawings. Enter changes and corrections on drawings promptly to reflect "Current Construction". Perform this update no less frequently than weekly for the blue line drawings and update no less frequently than quarterly for the CADD/CAD and BIM files, which were prepared previously in accordance with Section 01 33 16. Include a confirmation that the as-builts are up to date with the submission of the monthly project schedule.

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1.2.2.3. If the DB Contractor fails to maintain the as-built drawings as required herein, the Government will retain from the monthly progress payment, an amount representing the estimated monthly cost of maintaining the as-built drawings. Final payment with respect to separately priced facilities or the contract as a whole will be withheld until the Contractor submits acceptable as-built drawings and the Government approves them.

- 1.2.2.4. The marked-up set of drawings shall reflect any changes, alterations, adjustments or modifications. Changes must be reflected on all sheets affected by the change. Changes shall include marking the drawings to reflect structural details, foundation layouts, equipment sizes, and other extensions of design.
- 1.2.2.5. Typically, room numbers shown on the drawings are selected for design convenience and do not represent the actual numbers intended for use by the end user. Final as-built drawings shall reflect actual room numbers adopted by the end user.
- 1.2.2.6. If there is no separate contract line item (CLIN) for as-built drawings, the Government will withhold the amount of \$35,000, or 1% of the present construction value, whichever is the greater, until the final as-built drawing submittal has been approved by the Government.

1.2.3. Underground Utilities

The drawings shall indicate, in addition to all changes and corrections, the actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Locate Valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Record average elevation of the top of each run or underground structure..

1.2.4. Partial Occupancy

For projects where portions of construction are to be occupied or activated before overall project completion, including portions of utility systems, supply as-built drawings for those portions of the facility being occupied or activated at the time the facility is occupied or activated. Show this same as-built information previously furnished on the final set of as-built drawings.

1.2.5. As-Built Conditions That are Different From the construction Drawings

Accurately reflect all as-built conditions that are different, such as dimensions, road alignments and grades, and drainage and elevations, from the construction drawings on each drawing. If the as-built condition is accurately reflected on a shop drawing, then furnish that shop drawing in CADD format. Reference the final as-built construction drawing the shop drawing file that includes the as-built information. In turn, the shop drawing shall reference the applicable construction as-built drawing. Delete any options shown on drawings and not selected clearly reflect options selected on final as-built drawings.

1.2.6. Additional As-Built Information that Exceeds the Detail Shown on the construction Drawings:

These as-built conditions include those that reflect structural details, foundation layouts, equipment, sizes, mechanical and electrical room layouts and other extensions of design, that were not shown in the project design documents because the exact details were not known until after the time of approved shop drawings. It is recognized that these shop drawing submittals (revised showing as-built conditions) will serve as the as-built record without actual incorporation into the construction drawings, piping, and equipment drawings. Include locations of all explorations, logs of all explorations, and results of all laboratory testing, including those provided by the Government. Furnish all such shop drawings in CADD /CADformat. Include fire protection details, such as wiring, performed for the design of the project.

1.2.7. Final As-Built Drawings

Submit final as-built CADD/CAD and BIM Model(s) and Facility Data files at the time of Beneficial Occupancy of the project or at a designated phase of the project. In the event the Contractor accomplishes additional work after this submittal, which changes the as-built conditions, submit a new DVD with all drawing sheets and three blue-line copies of affected sheets which depict additional changes.

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1.2.8. Title Blocks

In accordance with the configuration management plan, clearly mark title blocks to indicate final as-built drawings.

1.2.9. Other As-Built Documents

Provide scans of all other documents such as design analysis, catalog cuts, certification documents that are not available in native electronic format in an organized manner in Adobe.pdf format.

1.2.9.1. LEED Documentation

Update LEED documentation on at least a monthly basis and have it available for review by the Government on the jobsite at all times during construction. Submit the final LEED Project Checklist(s), final LEED submittals checklist and complete project documentation, verifying the final LEED score and establishing the final rating. Provide full support to the validation review process, including credit audits. See also the LEED documentation requirements in Section 01 33 16, DESIGN AFTER AWARD.

1.2.9.2. GIS Documentation

Provide final geo-referenced GIS database of the new building footprint along with any changes made to exterior of the building. The intent of capturing the final building footprint and exterior modifications in a GIS database is to provide the installation with a data set of the comprehensive changes made to the landscape as a result of the construction project. The Government will incorporate this data set into the installations existing GIS MasterPlan or Enterprise GIS system. The GIS database deliverable shall follow a standard template provided to the Contractor by the Government, adhere to detailed specifications outlined in ECB No 2006-15, and be documented using the Federal Geographic Data Committee (FGDC) metadata standard.

1.3. EQUIPMENT DATA

1.3.1. Real Property Equipment

Provide an Equipment-in-Place list of all installed equipment furnished under this contract. Include all information usually listed on manufacturer's name plate. Include the cost of each piece of installed property F.O.B. construction site. For each of the items which is specified herein to be guaranteed for a specified period from the date of acceptance thereof, provide the following information: The name, serial and model number address of equipment supplier, or manufacturer originating the guaranteed item. The Contractor's guarantee to the Government of these items will not be limited by the terms of any manufacturer's guarantee to the Contractor. Furnish the list as one (1) reproducible and three (3) copies thirty (30) calendar days before completion of any segment of the contract work which has an incremental completion date.

1.3.2. Maintenance and Parts Data

Furnish a brochure, catalog cut, parts list, manufacturer's data sheet or other publication showing detailed parts data on all other equipment subject to repair and maintenance procedures not otherwise required in Operations and Maintenance Manuals specified elsewhere in this contract. Distribution of directives shall follow the same requirements as listed in paragraph above.

1.3.3. Construction Specifications

Furnish permanent electronic files of final as-built construction specifications, including modifications thereto, with the as-built drawings.

1.4. CONSTRUCTION WARRANTY MANAGEMENT

1.4.1. Prior to the end of the one year warranty, the Government may conduct an infrared roof survey on any project involving a membrane roofing system. This survey will be conducted in accordance with ASTM C1153-90, "Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging". The Contractor shall replace all damaged materials and locate and repair sources of moisture penetration.

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1.4.2. Management

1.4.2.1. Warranty Management Plan

Develop a warranty management plan containing information relevant to the clause *Warranty of Construction* in FAR 52.246-21. Submit the warranty management plan for Government approval at least 30 days before the planned pre-warranty conference. In the event of phased turn-over of the contract, update the Warranty Management Plan as necessary to include latest information required. Include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Submit warranty information made available during the construction phase prior to each monthly pay estimate. Assemble information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. The Contractor, Government, including the Customer Representative shall jointly conduct warranty inspections, 4 months and 9 months, after acceptance. The warranty management plan shall include, but shall not be limited to, the following information:

- (1) Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the contractors, subcontractors, manufacturers or suppliers involved.
- (2) Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.
- (3) A list for each warranted equipment, item, feature of construction or system indicating:
- (i) Name of item.
- (ii) Model and serial numbers.
- (iii) Location where installed.
- (iv) Name and phone numbers of manufacturers or suppliers.
- (v) Names, addresses and telephone numbers of sources of spare parts.
- (vi) Warranties and terms of warranty. Include one-year overall warranty of construction. Indicate those items, which have extended warranties with separate warranty expiration dates.
- (vii) Cross-reference to warranty certificates as applicable.
- (viii) Starting point and duration of warranty period.
- (ix) Summary of maintenance procedures required to continue the warranty in force.
- (x) Cross-reference to specific pertinent Operation and Maintenance manuals.
- (xi) Organization, names and phone numbers of persons to call for warranty service.
- (xii) Typical response time and repair time expected for various warranted equipment.
- (4) The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.
- (5) Procedure and status of tagging of all equipment covered by extended warranties.
- (6) Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- 1.4.3. Performance Bond
- 1.4.3.1. The Contractor's Performance Bond will remain effective throughout the construction warranty period.
- 1.4.3.2. In the event the Contractor or his designated representative(s) fails to commence and diligently pursue any work required under this clause, and in a manner pursuant to the requirements thereof, the Government shall have

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a right to demand that said work be performed under the Performance Bond by making written notice on the surety. If the surety fails or refuses to perform the obligation it assumed under the Performance Bond, the Government shall have the work performed by others, and after completion of the work, may make demand for reimbursement of any or all expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

- 1.4.3.3. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Government will have the right to recoup expenses from the bonding company.
- 1.4.3.4. Following oral or written notification of required warranty repair work, the Contractor will respond as dictated by para. 1.4.5. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Government to proceed against the Contractor as outlined in the paragraph 1.4.5.5 and/or above.

1.4.4. Pre-Warranty Conference

Prior to contract completion, or completion of any phase or portion of contract to be turned over, and at a time designated by the Contracting Officer, the Contractor shall meet with the Government to develop a mutual understanding with respect to the requirements of this clause. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Government for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warrantied construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of his responsibilities in connection with other portions of this provision.

1.4.5. Contractor's Response to Warranty Service Requirements.

Following Government oral or written notification, which may include authorized installation maintenance personnel, the Contractor shall respond to warranty service requirements in accordance with the "Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframe specified, the Government will perform the work and backcharge the construction warranty payment item established.

- 1.4.5.1. First Priority Code 1 Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.
- 1.4.5.2. Second Priority Code 2 Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.
- 1.4.5.3. Third Priority Code 3 All other work to be initiated within 3 work days and work continuously to completion or relief.
- 1.4.5.4. The "Warranty Service Priority List" is as follows:
- Code 1 Air Conditioning System
- (a) Buildings with computer equipment.
- (b) Barracks, mess halls (entire building down).
- Code 2 Air Conditioning Systems
- (a) Recreational support.
- (b) Air conditioning leak in part of building, if causing damage.
- (c) Air conditioning system not cooling properly

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- (d) Admin buildings with Automated Data Processing (ADP) equipment not on priority list.
- Code 1 Doors
- (a) Overhead doors not operational.
- Code 1 Electrical
- (a) Power failure (entire area or any building operational after 1600 hours).
- (b) Traffic control devices.
- (c) Security lights.
- (d) Smoke detectors and fire alarm systems
- (e) Power or lighting failure to an area, facility, portion of a facility, which may adversely impact health, safety, security, or the installation's mission requirement, or which may result in damage to property.
- Code 2 Electrical
- (a) Power failure (no power) for unoccupied buildings or portions thereof or branch circuits within occupied buildings, not listed as Code 1.
- (a) Receptacle and lights, not listed as code 1.
- Code 3 Electrical
- (a) Street, parking area lights
- Code 1 Gas
- (a) Leaks and breaks.
- (b) No gas to cantonment area.
- Code 1 Heat
- (a) Area power failure affecting heat.
- (b) Heater in unit not working.
- Code 2 Heat
- (a) All heating system failures not listed as Code 1.
- Code 3 Interior
- (a) Floor damage
- (b) Paint chipping or peeling
- Code 1 Intrusion Detection Systems N/A.
- Code 2 Intrusion Detection Systems other than those listed under Code 1
- Code 1 Kitchen Equipment
- (a) Dishwasher.
- (b) All other equipment hampering preparation of a meal.
- Code 2 Kitchen Equipment
- (a) All other equipment not listed under Code 1.
- Code 2 Plumbing
- (a) Flush valves not operating properly
- (b) Fixture drain, supply line commode, or water pipe leaking.
- (c) Commode leaking at base.
- Code 3 Plumbing
- (a) Leaking faucets

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- Code 1 Refrigeration
- (a) Mess Hall.
- (b) Medical storage.
- Code 2 Refrigeration
- (a) Mess hall other than walk-in refrigerators and freezers.
- Code 1 Roof Leaks
- (a) Temporary repairs will be made where major damage to property is occurring.
- Code 2 Roof Leaks
- (a) Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.
- Code 1 Sprinkler System
- (a) All sprinkler systems, valves, manholes, deluge systems, and air systems to sprinklers.
- Code 1 Tank Wash Racks (Bird Baths)
- (a) All systems which prevent tank wash.
- Code 1 Water (Exterior)
- (a) Normal operation of water pump station.
- Code 2 Water (Exterior)
- (a) No water to facility.
- Code 1 Water, Hot (and Steam)
- (a) Barracks (entire building).
- Code 2 Water, Hot
- (a) No hot water in portion of building listed under Code 1
- 1.4.5.5. Should parts be required to complete the work and the parts are not immediately available, the Contractor shall have a maximum of 12 hours after arrival at the job site to provide the Government, with firm written proposals for emergency alternatives and temporary repairs for Government participation with the Contractor to provide emergency relief until the required parts are available on site for the Contractor to perform permanent warranty repair. The Contractors proposals shall include a firm date and time that the required parts shall be available on site to complete the permanent warranty repair. The Government will evaluate the proposed alternatives and negotiate the alternative considered to be in the best interest of the Government to reduce the impact of the emergency condition. Alternatives considered by the Government will include the alternative for the Contractor to "Do Nothing" while waiting until the required parts are available to perform permanent warranty repair. Negotiating a proposal which will require Government participation and the expenditure of Government funds shall constitute a separate procurement action by the using service.
- 1.4.6. Equipment Warranty Identification Tags
- 1.4.6.1. Provide warranty identification tags at the time of installation and prior to substantial completion shall provide warranty identification tags on all Contractor and Government furnished equipment which the Contractor has installed.
- (a) The tags shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure-sensitive adhesive back, and they shall be installed in a position that is easily (or most easily) noticeable. Tag each component of contractor furnished equipment that has differing warranties on its components.
- (b) Submit sample tags, representing how the other tags will look, for Government review and approval.
- (c) Tags for Warrantied Equipment: The tag for this equipment shall be similar to the following: Exact format and size will be as approved.

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EQUIPMENT WARRANTY - CONTRACTOR FURNISHED EQUIPMENT
MFG NAME MODEL NO.
SERIAL NO.
CONTRACT NO.
CONTRACTOR NAME
CONTRACTOR WARRANTY EXPIRES
MFG WARRANTY(IES) EXPIRE

EQUIPMENT WARRANTY - GOVERNMENT FURNISHED EQUIPMENT
MFG NAME MODEL NO.
SERIAL NO.
CONTRACT NO.
DATE EQUIP PLACED IN SERVICE
MFG WARRANTY(IES) EXPIRE

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(d) If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag

1.4.6.2. Execution: Complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment.

1.5. MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Submit; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems prior to final inspection and transfer of the completed facility for approval, as specified in applicable technical specification sections.

1.6. OPERATION AND MAINTENANCE MANUALS

1.6.1. General Requirements

- 1.6.1.1. Inasmuch as the operations and maintenance manuals are required to operate and maintain the facility, the operations and maintenance (O&M) manuals will be considered a requirement prior to substantial completion of any facility to be turned over to the Government. Beneficial occupancy of all or portions of a facility prior to substantial completion will not relieve the Contractor of liquidated damages, if substantial completion exceeds the required completion date.
- 1.6.1.2. Provide one permanent electronic copy on CD-ROM and 2 hard copies of the Equipment Operating, Maintenance, and Repair Manuals. Provide separate manuals for each utility system as defined hereinafter. Submit Operations and Maintenance manuals for approval before field training or 90 days before substantial completion (whichever occurs earlier). If there is no separate CLIN for O&M Manuals, the Government will withhold an amount representing \$20,000, as non-progressed work, until submittal and approval of all O&M manuals are complete.

1.6.2. Definitions

1.6.2.1. Equipment

A single piece of equipment operating alone or in conjunction with other equipment to accomplish a system function.

1.6.2.2. System

A combination of one or more pieces of equipment which function together to accomplish an intended purpose (i.e. HVAC system is composed of many individual pieces of equipment such as fans, motors, compressors, valves, sensors, relays, etc.)

1.6.3. Hard Cover Binders

The manuals shall be hard cover with posts, or 3-ring binders, so sheets may be easily substituted. Print the following identification on the cover: the words "EQUIPMENT OPERATING, MAINTENANCE, AND REPAIR MANUALS," the project name, building number, and an indication of utility or systems covered, the name of the Contractor, and the Contract number. Manuals shall be approximately 8-1/2 by 11-inches with large sheets folded in and capable of being easily pulled out for reference. All manuals for the project must be similar in appearance, and be of professional quality.

1.6.4. Warning Page

Provide a warning page to warn of potential dangers (if they exist, such as high voltage, toxic chemicals, flammable liquids, explosive materials, carcinogens, high pressures, etc.). Place the warning page inside the front cover and in front of the title page. Include any necessary Material Safety Data Sheets (MDSD) here.

1.6.5. Title Page

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The title page shall include the same information shown on the cover and show the name of the preparing firm and the date of publication.

1.6.6. Table of Contents

Each volume of the set of manuals for this project shall include a table of contents, for the entire set, broken down by volume.

1.6.7. GENERAL

Organize manuals according to the following format, and include information for each item of equipment Submit a draft outline and table of contents for approval at 50% contract completion.

TABLE OF CONTENTS

PART I: Introduction

Equipment DescriptionFunctional DescriptionInstallation Description

PART II: Operating Principles

PART III: Safety

PART IV: Preventive Maintenance

Preventive Maintenance Checklist, Lubrication

Charts and Diagrams

PART V: Spare Parts Lists

- Troubleshooting Guide
- Adjustments
- Common Repairs and Parts Replacement

PART VI: Illustrations

1.6.7.1. Part I-Introduction

Part I shall provide an introduction, equipment or system description, functional description and theory of operation, and installation instructions for each piece of equipment. Include complete instructions for uncrating, assembly, connection to the power source and pre-operating lubrication in the installation instructions as applicable. Illustrations, including wiring and cabling diagrams, are required as appropriate in this section. Include halftone pictures of the equipment in the introduction and equipment description, as well as system layout drawings with each item of equipment located and marked. Do not use copies of previously submitted shop drawings in these manuals.

1.6.7.2. Part II-Operating Principles

Part II shall provide complete instructions for operating the system, and each piece of equipment. Illustrations, halftone pictures, tables, charts, procedures, and diagrams are required when applicable. This will include step-by-step procedures for start-up and shutdown of both the system and each component piece of equipments, as well as adjustments required to obtain optimum equipment performance, and corrective actions for malfunctions. Show performance sheets and graphs showing capacity data, efficiencies, electrical characteristics, pressure drops, and flow rates here, also. Marked-up catalogs or catalog pages do not satisfy this requirement. Present performance information as concisely as possible with only data pertaining to equipment actually installed. Include actual test data collected for Contractor performance here.

1.6.7.3. Part III-Safety

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Part III shall contain the general and specific safety requirements peculiar to each item of equipment. Repeat safety information as notes cautions and warnings in other sections where appropriate to operations described.

1.6.7.4. Part IV-Preventive Maintenance

Part IV shall contain a troubleshooting guide, including detailed instructions for all common adjustments and alignment procedures, including a detailed maintenance schedule. Also include a diagnostic chart showing symptoms and solutions to problems. Include test hookups to determine the cause, special tools and test equipment, and methods for returning the equipment to operating conditions. Information may be in chart form or in tabular format with appropriate headings. Include instructions for the removal, disassembly, repair, reassembly, and replacement of parts and assemblies where applicable and the task is not obvious.

1.6.7.5. Part V-Spare Parts List

Part V shall contain a tabulation of description data and parts location illustrations for all mechanical and electrical parts. The heading of the parts list shall clearly identify the supplier, purchase order number, and equipment. Include the unit price for each part. List parts by major assemblies, and arrange the listing in columnar form. Include names and addresses of the nearest manufacturer's representatives, as well as any special warranty information. Provide a list of spare parts that are recommended to be kept in stock by the Government installation.

1.6.7.6. Part VI-Illustrations

Part VI shall contain assembly drawings for the complete equipment or system and for all major components. Include complete wiring diagrams and schematics. Other illustrations, such as exploded views, block diagrams, and cutaway drawings, are required as appropriate.

1.6.8. Framed Instructions

Post framed instructions are required for substantial completion. Post framed instructions under glass or in laminated plastic, including wiring and control diagrams showing the complete layout of the entire system, including equipment, ductwork, piping valves, dampers, and control sequence at a location near the equipment described. Prepare condensed operating instructions explaining preventive maintenance procedures methods of checking the system for normal safe operation, valve schedule and procedures for safely starting and stopping the system in type form, framed as specified above for the wiring and control diagrams and posted beside the diagrams. Submit proposed diagrams, instructions, and other sheets prior to posting. Post the framed instructions before field training.

1.6.9. (Reserved. See 1.7 for Field Training)

1.6.10. System/Equipment Requirements

1.6.10.1. Facility Heating System

Provide information on the following equipment: boilers, water treatment, chemical feed pumps and tanks, converters, heat exchangers, pumps, unit heaters, fin-tube radiation, air handling units (both heating only and heating and cooling), and valves (associated with heating systems).

1.6.10.2. Air-Conditioning Systems

Provide information in chillers, packaged air-conditioning equipment, towers, water treatment, chemical feed pumps and tanks, air-cooled condensers, pumps, compressors, air handling units, and valves (associated with air-conditioning systems).

1.6.10.3. Temperature Control and HVAC Distribution Systems

Provide all information described for the following equipment: valves, fans, air handling units, pumps, boilers, converters and heat exchangers, chillers, water cooled condensers, cooling towers, and fin-tube radiation, control air compressors, control components (sensors, controllers, adapters and actuators), and flow measuring equipment.

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1.6.10.4. Central Heating Plants

Provide the information described for the following equipment: boilers, converters, heat exchangers, pumps, fans, steam traps, pollution control equipment, chemical feed equipment, control systems, fuel handling equipment, deaerators, tanks (flash, expansion, return waters, etc.), water softeners, and valves.

1.6.10.5. Heating Distribution Systems

Provide the information described for the following equipment: valves, fans, pumps, converters and heat exchangers, steam traps, tanks (expansion, flash, etc.), and piping systems.

1.6.10.6. Exterior Electrical Systems

Provide information on the following equipment: power transformers, relays, reclosers, breakers, and capacitor bank controls.

1.6.10.7. Interior Electrical Systems

Provide information on the following equipment: relays, motor control centers, switchgear, solid state circuit breakers, motor controller, EPS lighting systems, wiring diagrams and troubleshooting flow chart on control systems, and special grounding systems.

1.6.10.8. Energy Monitoring and Control Systems

The maintenance manual shall include descriptions of maintenance for all equipment, including inspection, periodic preventative maintenance, fault diagnosis, and repair or replacement of defective components.

1.6.10.9. Domestic Water Systems

Provide the identified information on the following equipment: tanks, unit process equipment, pumps, motors, control and monitoring instrumentation, laboratory test equipment, chemical feeders, valves, switching gear, and automatic controls.

1.6.10.10. Wastewater Treatment Systems

Provide the identified information on the following equipment: tanks, unit process equipment, pumps, motors, control and monitoring instrumentations, laboratory test equipment chemical feeders, valves, scrapers, skimmers, comminutors, blowers, switching gear, and automatic controls.

1.6.10.11. Fire Protection Systems

Provide information on the following equipment: alarm valves, manual valves, regulators, foam and gas storage tanks, piping materials, sprinkler heads, nozzles, pumps, and pump drivers.

1.6.10.12. Fire Alarm and Detection Systems

- (1) The maintenance manual shall include description of maintenance for all equipment, including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components.
- (2) Provide all software; database with complete identification of programmable portions of system equipment and devices, and all other system programming data on all modes of the system; connecting cables; and proprietary equipment necessary for the operation, maintenance, testing, repair and programming, etc. of the system and that may be required for implementation of future changes to the fire system (additional and/or relocated initiating devices, notification devices, etc.
- (3) Provide all system and equipment technical data and computer software with the requisite rights to Government use, in accordance with the applicable contract clauses.
- (4) Training shall include software and programming required for the effective operation, maintenance, testing, diagnostics and expansion of the system.

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1.6.10.13. Plumbing Systems

Provide information on the following equipment: water heaters, valves, pressure regulators backflow preventors, piping materials, and plumbing fixtures.

1.6.10.14. Liquid Fuels Systems

Provide information on the following equipment: tanks, automatic valves manual valves, filter separators, pumps, mechanical loading arms, nozzles, meters, electronic controls, electrical switch gear, and fluidic controls.

1.6.10.15. Cathodic Protection Systems

Provide information on the following material and equipment: rectifiers, meters, anodes, anode backfill, anode lead wire, insulation material and wire size, automatic controls (if any), rheostats, switches, fuses and circuit breakers, type and size of rectifying elements, type of oil in oil-immersed rectifiers, and rating of shunts.

1.6.10.16. Generator Installations

Provide information on the following equipment: generator sets, automatic transfer panels, governors, exciters, regulators starting systems, switchgear, and protective devices.

1.6.10.17. Miscellaneous Systems

Provide information on the following: communication and ADP systems, security and intrusion alarm, elevators, material handling, active solar, photovoltaic, nurse call, paging, intercom, closed circuit TV, irrigation, sound and material delivery systems, kitchen, refrigeration, disposal, ice making equipment, and other similar type special systems not otherwise specified.

1.6.10.18. Laboratory, Environmental and Pollution Control Systems

Provide information on the following equipment: wet scrubbers, quench chambers, scrub tanks, liquid oil separators, and fume hoods.

1.7. FIELD TRAINING

Field Training is a requirement for substantial completion. Conduct a training course for the operating staff for each particular system. Conduct the training is to be conducted during hours of normal working time after the system is functionally complete. The field instructions shall cover all of the items contained in the Equipment Operating, Maintenance and Repair Manuals. The training will include both classroom and "hands-on" training. Submit a lesson plan outlining the information to be discussed during training periods. Submit this lesson plan for approval 90 days before contract completion before the field training occurs. Record training on DVD and furnish to the Government within ten (10) days following training. Document all training and furnish a list of all attendees.

1.8. PRICING OF CONTRACTOR-FURNISHED AND INSTALLED PROPERTY AND GOVERNMENT-FURNISHED CONTRACTOR-INSTALLED PROPERTY

Promptly furnish and require any sub-contractor or supplier to furnish, in like manner, unit prices and descriptive data required by the Government for Property Record purposes of fixtures and equipment furnished and/or installed by the Contractor or sub-contractor, except prices do not need to be provided for Government-Furnished Property.

1.9. LEED REVIEW MEETINGS

- 1.9.1. Pre-Closeout Meeting. Approximately 30 days before submittal of LEED closeout documentation, the Contractor and the Government's project delivery team (including Installation representative) will meet to review the documentation, determine which, if any, credits will be audited and identify any corrections/missing items prior to the closeout LEED documentation submittal.
- 1.9.2. Approximately 14 days after submittal of LEED closeout documentation, the Contractor and the Government's project delivery team (including Installation representative) will meet to review the LEED closeout

documentation. The review conference will include discussion of and resolution of all review comments to ensure consensus on achievement of credits and satisfactory documentation. At the review conference a final score will be determined and endorsed in writing by all parties.

1.10. RED ZONE MEETING

At approximately 80% of contract completion or 60 days before the anticipated Beneficial Occupancy Date (BOD), whichever occurs first, the Contractor and the Government's project delivery team will conduct what is known as the Red Zone Meeting to discuss the close-out process, to schedule the events and review responsibilities for actions necessary to produce a timely physical, as well as fiscal, project close-out. The Red Zone meeting derives its name from the football term used to describe the team effort to move the ball the last 20 yards into the end zone. The close-out of a construction project sometimes can be equally as hard and most definitely requires the whole team's efforts. The ACO will chair the meeting. If not already provided, shortly before the meeting, the Contractor shall provide an electronic copy or access to the CADD as-built drawings, completed commensurate with the amount of work completed at the time of the Red Zone Meeting, as an indicator of the Contractors' understanding of and ability to meet the USACE CADD Standards and to ensure that the Contractor is making progress with CADD As-Built requirements. EXHIBIT 1 is a generic meeting checklist.

1.11. FINAL CLEANING

Clean the premises in accordance with FAR clause 52.236-12 and additional requirements stated here. Remove stains, foreign substances, and temporary labels from surfaces. Vacuum carpet and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean or replace filters of operating equipment if cleaning isn't possible or practicable. Remove debris from roofs, drainage systems, gutters, and downspouts. Sweep paved areas and rake clean landscaped areas. Remove waste, surplus materials, and rubbish from the site. Remove all temporary structures, barricades, project signs, fences and construction facilities. Submit a list of completed cleanup items on the day of final inspection.

1.12. INTERIM FORM DD1354 "TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete, update draft provided with the final design package(s) (see Section 01 33 16, paragraph 3.7.5) and submit an accounting of all installed property on Interim Form DD1354 "Transfer and Acceptance of Military Real Property." Include any additional assets/improvements/alterations and cost updates from the Draft DD Form 1354. Contact the COR for any project specific information necessary to complete the DD Form 1354. This form will be a topic for the Red Zone Meeting discussed above. For information purposes, a blank DD Form 1354 (fill-able) in ADOBE (PDF) may be obtained at the following web site: http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf Submit the completed Checklist for Form DD1354 of Government-Furnished and Contractor-Furnished/Contractor Installed items. Attach this list to the updated DD Form 1354. Instructions for completing the form and a blank checklist (fill-able) in ADOBE (PDF) may be obtained at the following web site:

http://www.wbdq.org/ccb/DOD/UFC/ufc 1 300 08.pdf

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EXHIBIT 1

SAMPLE

Red Zone Meeting Checklist

Date:		
Contract No.		
Description / Location		
Contractor		
Contracting Officer		

Action	Completion Milestone	1
Inspections		
Fire		
Safety		
Pre-final		
Mechanical Test & Balance		
Commissioning		
Landscaping Complete		
Erosion Control		
Beneficial Occupancy Date (BOD)		
Furniture Installation		
Comm Installation		
As-Built Drawings		
Provide all O&M manuals, tools, shop drawings, spare parts, etc. to customer		
Training of O&M Personnel		
Provide Warranty documents to Customer		
Contract completion		

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Ribbon cutting	
Payroll Clearances	
DD Form 2626 - Construction Contractor Performance Evaluation	
DD Form 2631 – A-E Performance Rated after Construction	
Status of Pending Mods and REA's/Claims	
Final Payment Completed	
Release of Claims	
Return of Unobligated Funds	
Move Project from CIP to General Ledger	
Financial completion	

End of Section 01 78 02.00 10

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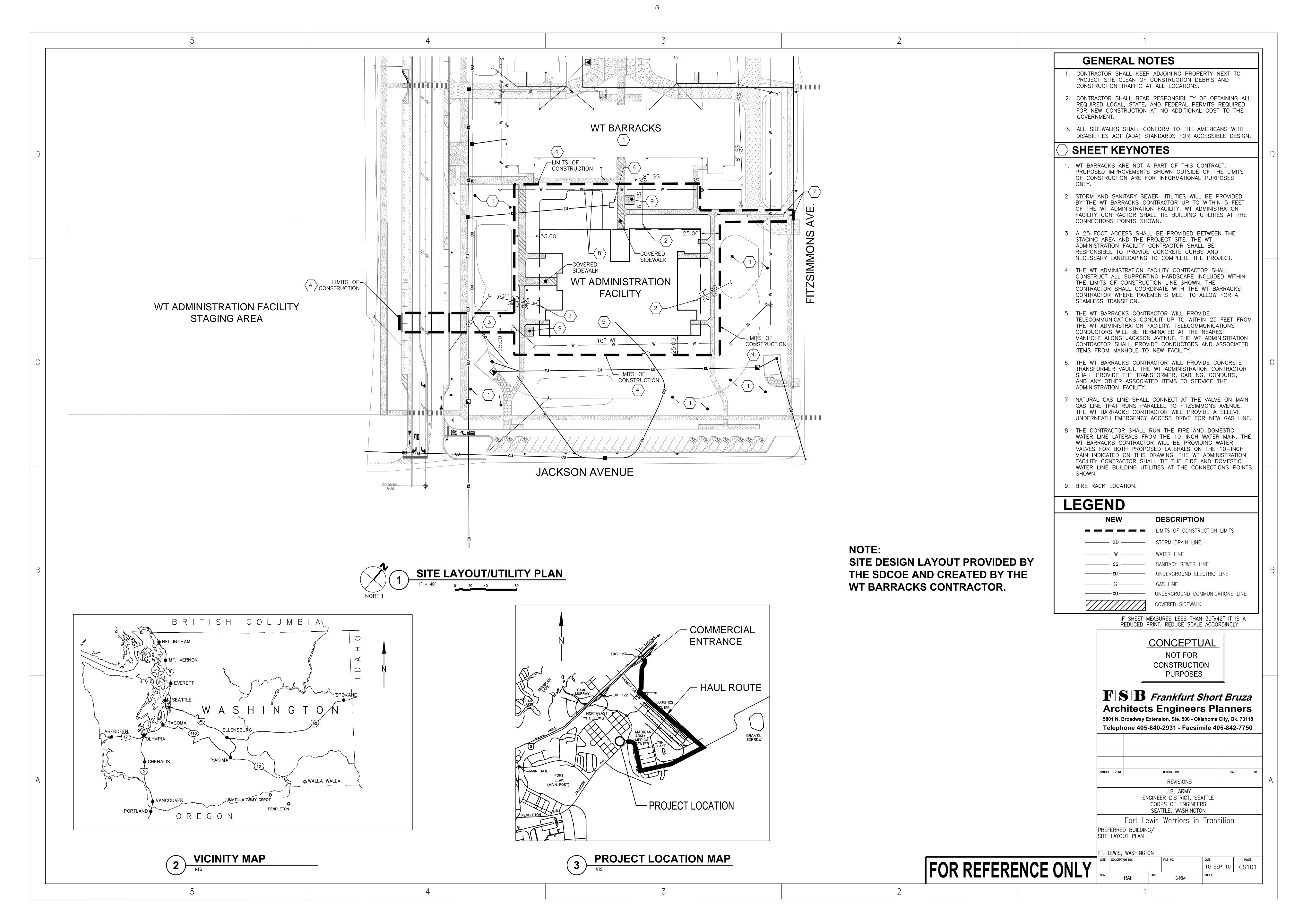
APPENDIX A Geotechnical Information

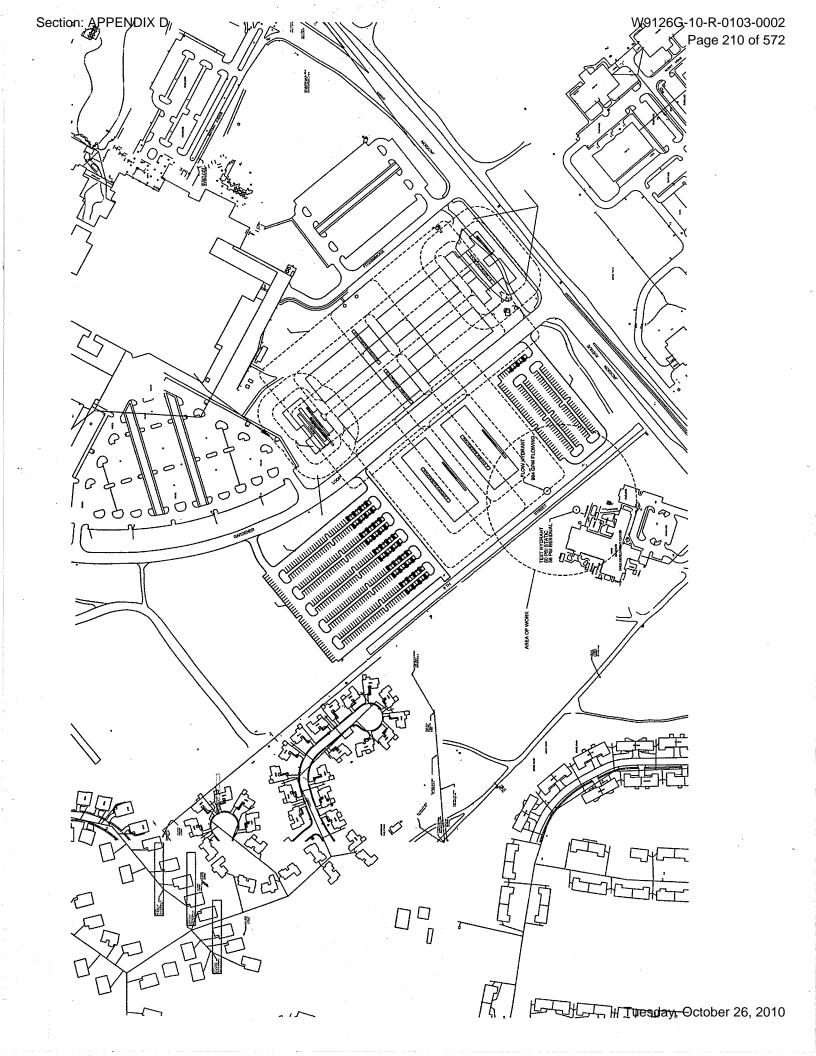
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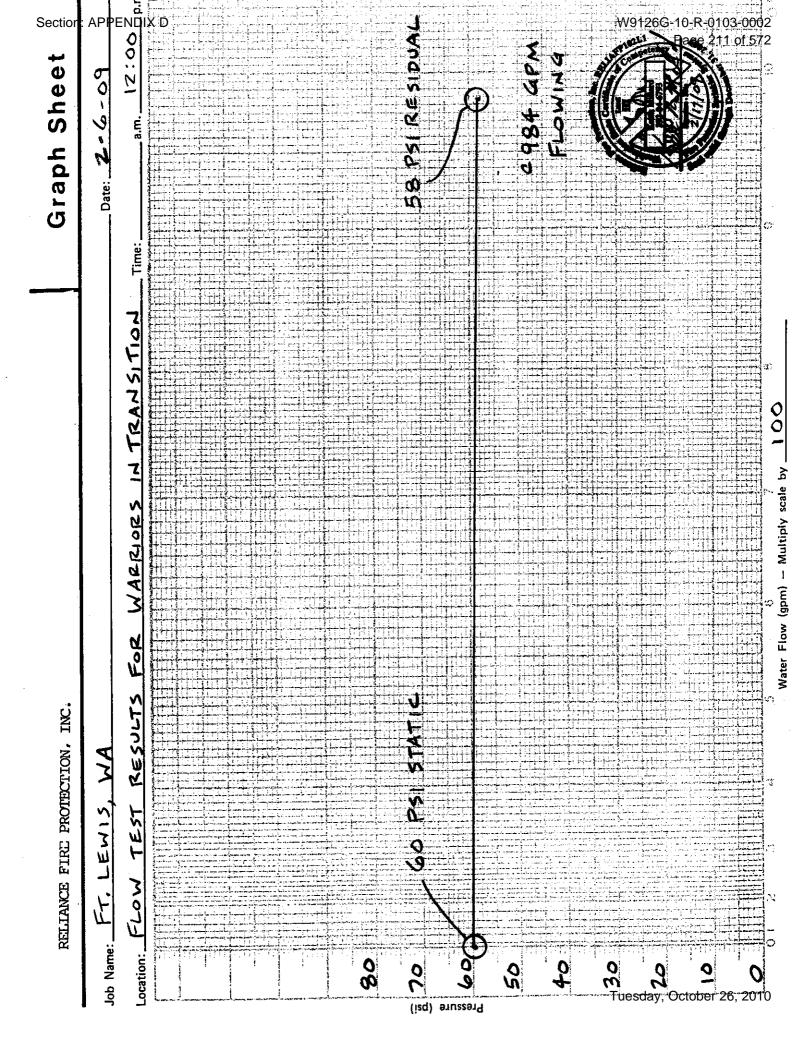
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APPENDIX B List of Drawings

Not Used







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APPENDIX E Environmental Information

Not Used

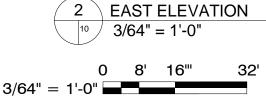
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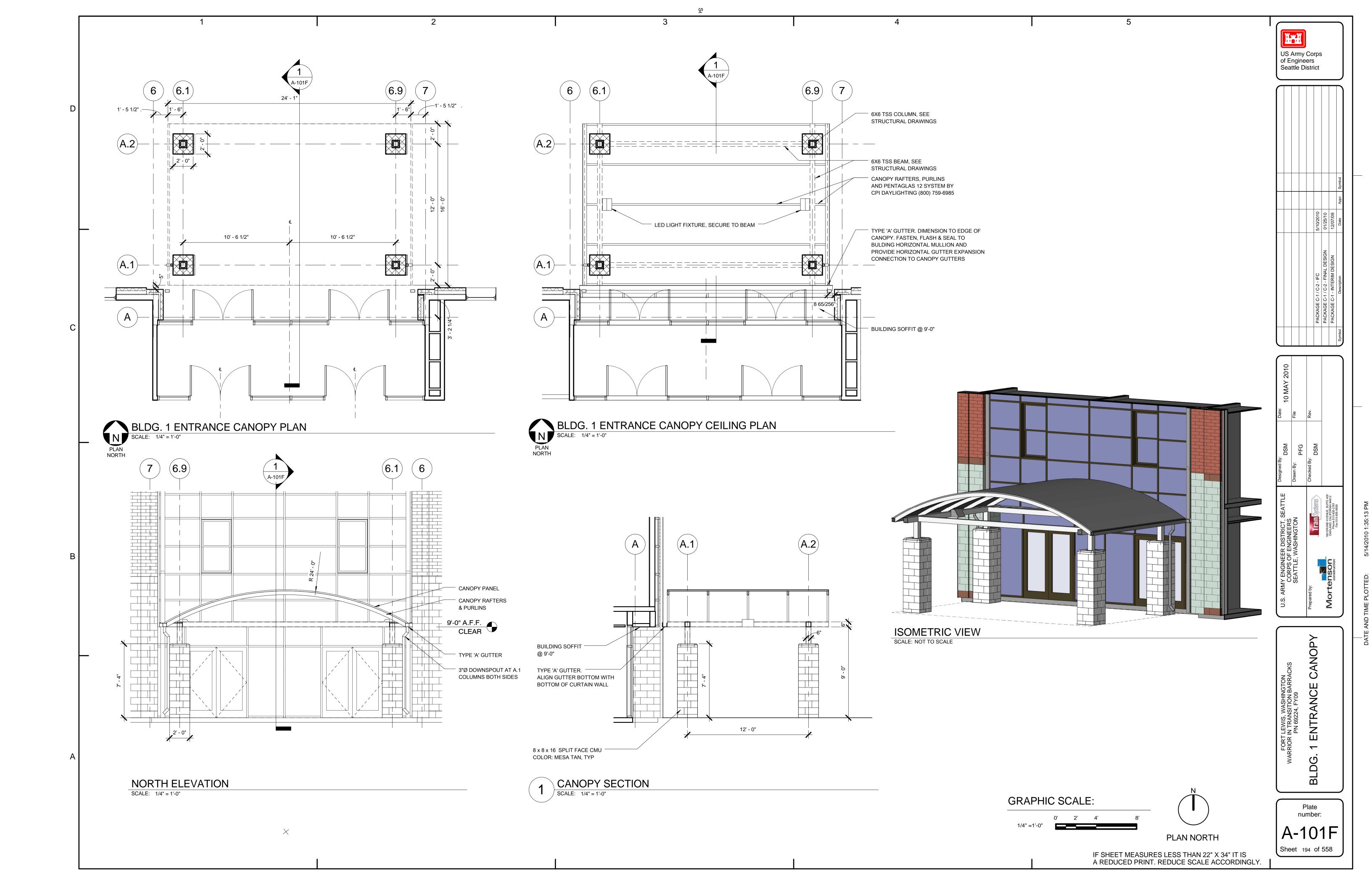
Warriors

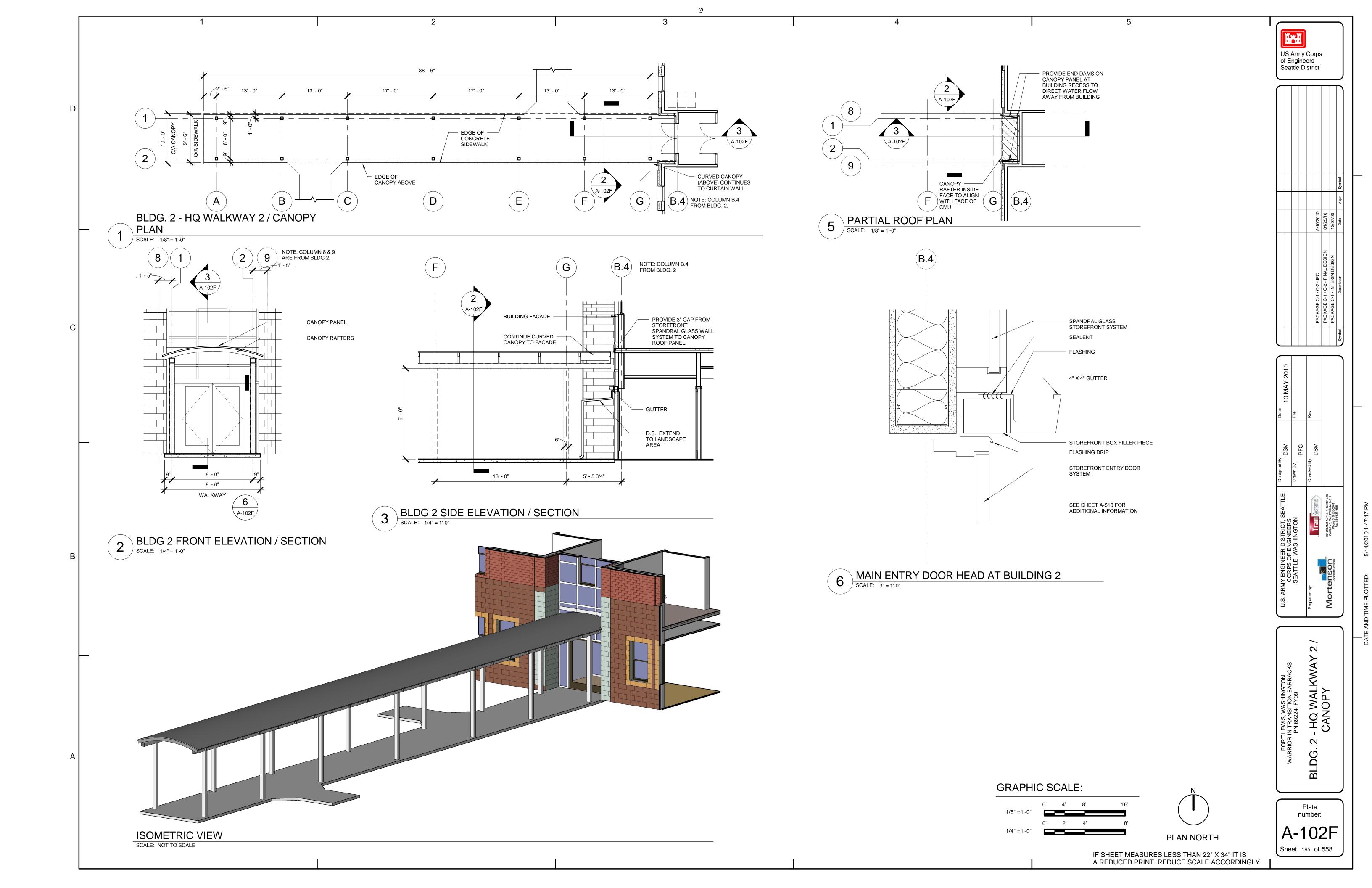


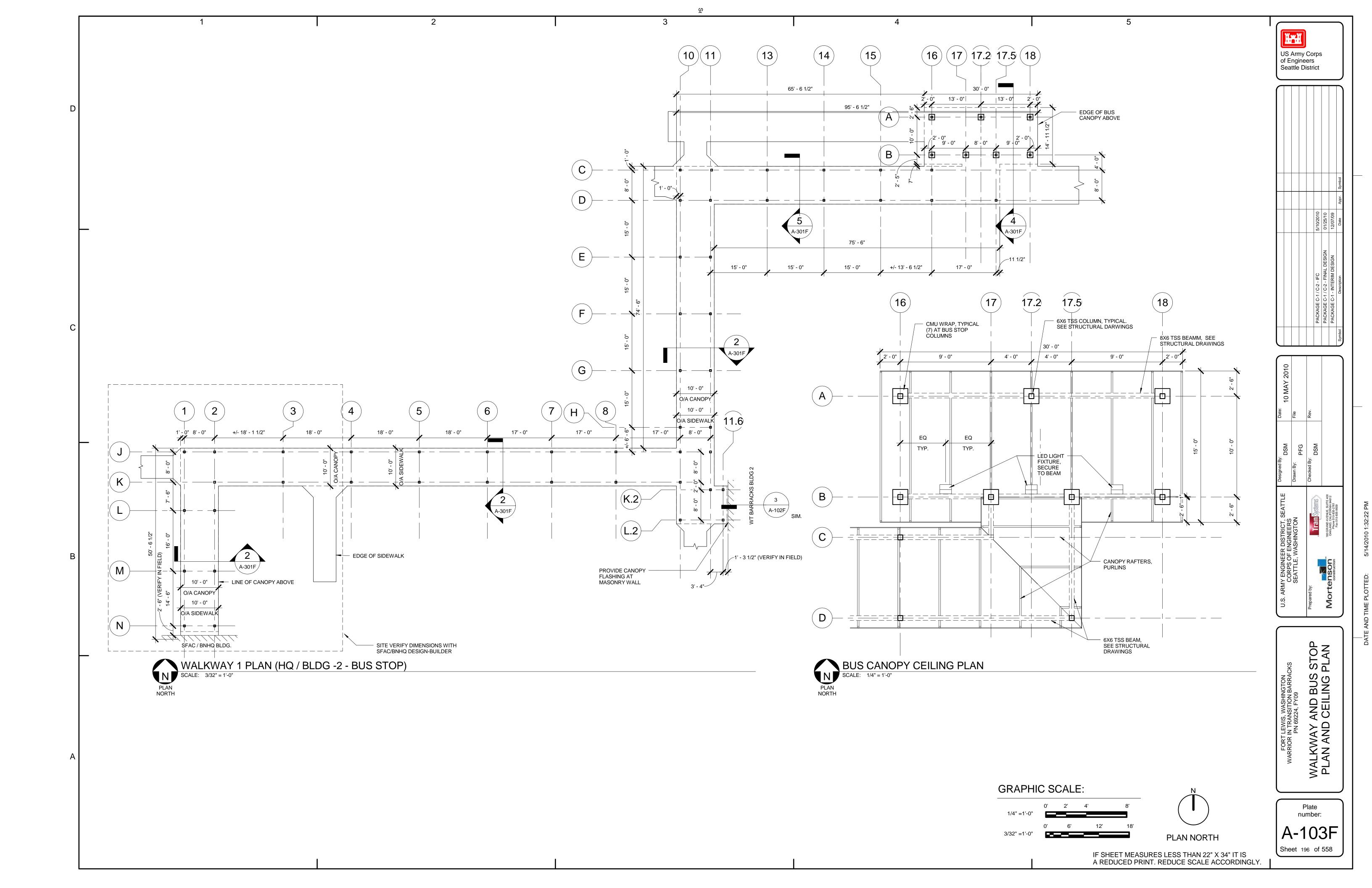


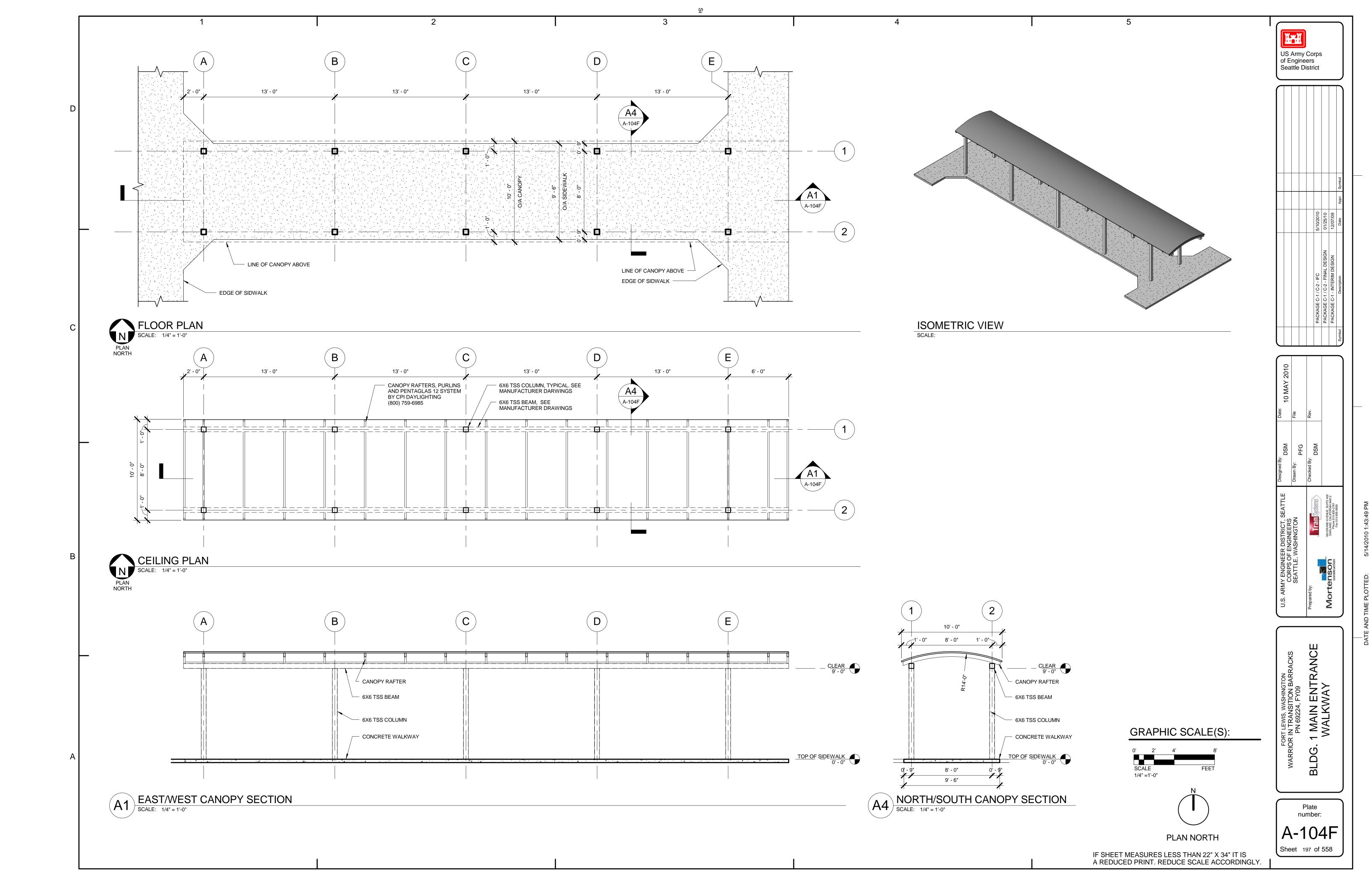


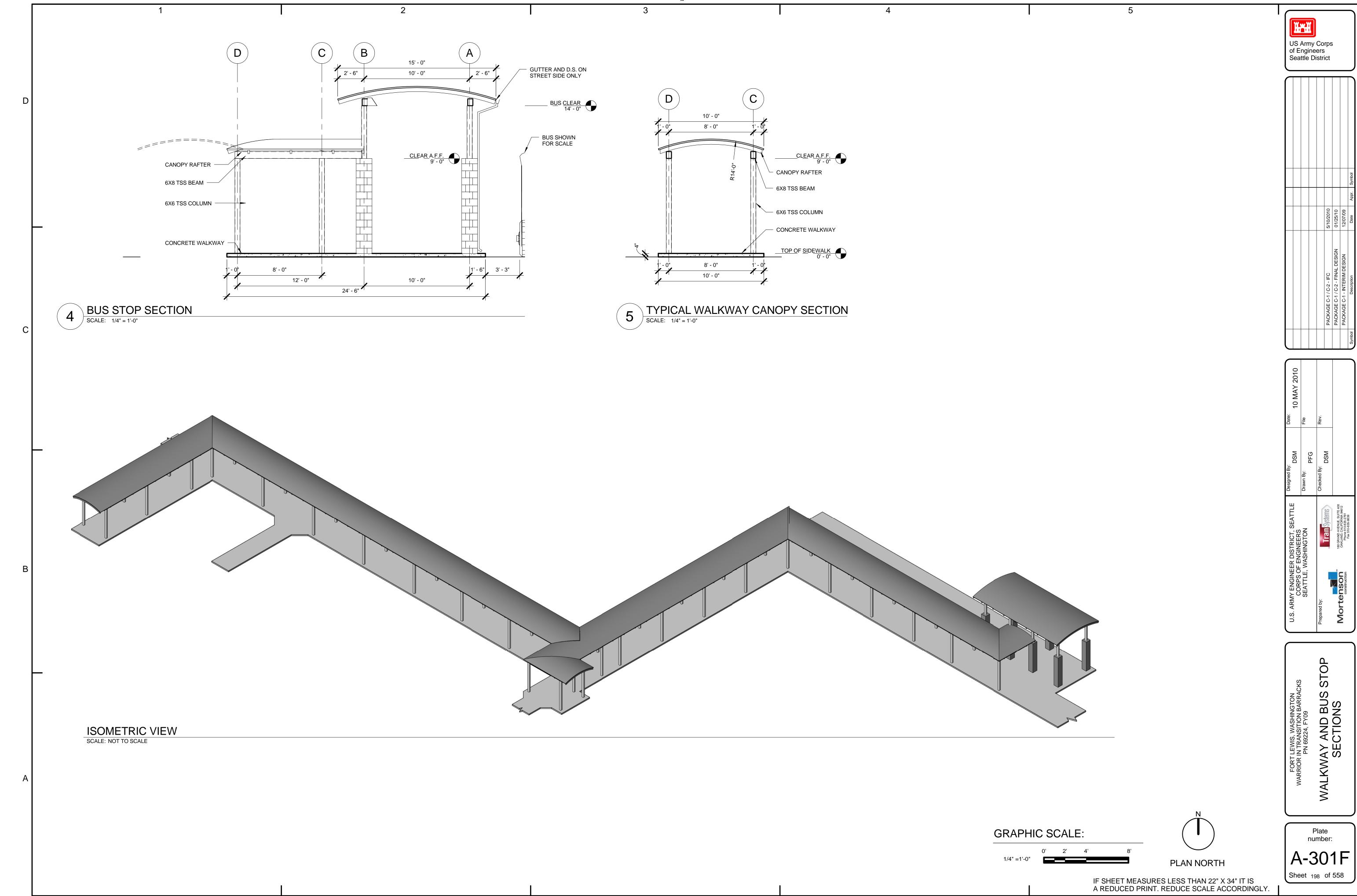












Fax 510-835-9839

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APPENDIX G GIS Data

Not Used

EXTERIOR SIGNAGE

- PURPOSE: Photographic examples of exterior signage are provided in this appendix to illustrate the range of free-standing exterior building signs currently existing on North Fort Lewis. Exterior signs indicating the occupant unit(s) are required for all facilities, except for UEPH. Provide signage that is weather resistant; consistent in design, materials and color with its building; and sufficiently illuminated to be legible at night. Because occupant units will often relocate, signage should permit changing text or a sign placard without significant reconstruction of the supporting structure.
- CONTEXT: Where the facility to be constructed is an infill project (such as the Enlisted Personnel Dining Facility), the exterior, free standing sign structure should be consistent with adjacent buildings and signage. Where a new facility will develop the aesthetic identity for that zone, signage in that area may be developed to present a new image. However, all signage must be compatible with installation design themes and military identity.



Photo 1 - Building/Unit Identification - Dining Facility

Photo 2 – Building/Unit Identification – Battalion Headquarters (before completion of text)



Photo 3 - Building/Unit Identification - Brigade Headquarters



Photo 4 - Building/Unit Identification - Battalion Headquarters



Photo 5 - Building/Unit Identification - Company Operations Facilities



Photo 6 - Building Number Sign - Provide 4 total, one each elevation (diagonal pairs).



PLANT SEI	ECTION	Ту	pe	G	row	th	F	lowe	er	In	tere	st]	Ligh	t	Re sta	esi ant		Soil oistu				I	unc	tion			
LIST Plant Materials Sui		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name				C	Char	acte	risti	ics							Cul	ture							Us	se			
DECIDUOL	US TREES																											
Acer Circinatum	Vine Maple	•			•							•		•		•	•		•				•					
Acer Ginnala	Amur Maple	٠			•							•				•	٠		٠									٠
Acer Griseum	Paperbark Maple	•			•						•			•			•		•									•
Acer Palmatum	Japanese Maple	•			•							•		•			•		•									•
Acer Rubrum	"Scarlet Sentinel" Red Maple	٠				٠						٠	J	٠	J		•		٠		•			J				
Acer Rubrum	"Autumn Blaze" Red Maple	٠				٠						•		•			•		٠		•							
Acer Rebrum	"Red Sunset" Red Maple	•				٠						•		٠			*		•		•							
Acer Saccharum	"Bonfire" Sugar Maple	٠			•							٠			٠		•					٠						
Acer Saccharum	"Green Mountain Sugar Maple	٠			*				*			•			٠		*					•						
Amelanchier Laevis	Serviceberry	*			*					*		*		•					*					•				
Betula	Jacquemont	•				•					•				•			•						•				
Jacquemontii Carpinus Betulus	Birch Columnar	•		•								•		•				•			•		•	•				
"Fastigiata" Cercidiphyllum Japonicum	Hornbeam Katsura Tree	•		•								•		•			•	•			•							
Cercis Occidentalis	Western Rosebud	٠			٠				•	•	٠	٠		٠		٠	٠		٠		•			٠				•
Cornus Kousa	Kousa Dogwood	٠		•				•		•	٠	•		•			٠	•					•	٠				•
Continus Coggygria "Purpureus"	Smoke Tree	٠		*				*		٠		٠			٠	*	•		٠									
Fraxinus Oxycarpa	Raywood Ash	•				•		•				•			•		•		•		•	٠						
Fraxinus Pennsylvanica	Cimmaron Ash	٠				٠		٠				٠			٠		٠		٠		•	٠						
Fraxinus Pennsylvanica "Marshall's Seedless"	Seedless Green Ash	٠				•		•				•			٠		•		٠		٠	٠						
Fraxinus Pennsylvanica	Patmore Ash	•				٠		*				•			•		*		•		•	٠						
Ginkgo Bilboa "Autumn Gold"	Maidenhair Tree	*		•				•				•			•		•		•		•							•
Gleditsia Triancanthos	"Shademaster" Honey Locust	٠			٠							٠			٠		٠		٠			٠						•
Gleditsia Triacanthos	"Skyline" Honey Locust	•			•							•			•		•		•			•						•

PLANT SI	ELECTION	Т	ype	C	Grow	th	I	Flow	er	In	teres	st		Ligh	t	Ro sta		М	Soil oistu	ıre				Fun	ction			-
LIST Plant Materials	Suitability Section	Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name						Ch	arac	teri	stics							C	ultu	re					U	se			
DECIDUO	OUS TREES -	C(NT	Π	NU:	ED)																					
Larix Occidentalis	Western Larch	•				•						•			•			٠					•	٠				•
Liquidambar Styracflua	American Sweetgum	•			•						٠	*			•				٠									
Liriodendrum Tulipfera	Tulip Tree	٠				٠		٠		+	٠	٠			•			٠				٠						
Magnolia Soulangeana	Saucer Magnolia	•			•				•	•				٠				٠				٠						٠
Magnolia Stellata	Star Magnolia	٠		٠					٠	+				٠				٠										٠
Malus "Centurion"	Centurion Crabapple	•			•				+	•					•				•									٠
Malus "Prairiefire"	Prairiefire Crabapple	•			٠				•	•					•				٠									٠
Malus "Sugartyme"	Sugartyme Crabapple	•			٠				•	•					•				٠									٠
Parrotia Persica	Persian Parrotia	٠		٠					•	•	٠	٠		٠			•		٠									٠
Pyrus Calleryana	"Chanticleer" Flowering Pear	•			•				•	•		٠			•				•									٠
Styrax Obassia	Fragrant Snowbell	٠		٠				٠		•		٠		٠			•	٠										٠
Tilia Tomentosua	Silver Linden	٠			•			•		•		•			•	•			•			•						
Tilia Cordata	Greenspire Linden	•			•			•		•		•			•	•			٠			٠						
Zelkova Serrata	"Village Green" Sawleaf Zelkova	٠					•					*				٠	٠		•		•	٠						

		T	ype	G	row	th	F	lowe	r	In	ntere	st		Ligh	t	Re tai			Soil oistu	re				Fun	ction	l .		
PLANT SELE Plant Materials Suitab		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name				C	har	acte	risti	cs							Cult	ure							U	se			
EVERGREEN	TREES																											
Calocedrus Decurrens	Incense Cedar		•		٠							*		•		•	•		٠				*					
Cedrus Atlantica	Atlas Cedar		•	•								•			•	•			*				•					
Cedrus Deodara	Deodar Cedar		•	•								*			•	*			•				•					
Chamaecyparis Nootkatensis	Alaska Yellow Cedar		٠	٠								•		٠				٠					٠					٠
Chamaecyparis Obtusa	Hinoki False Cypress		*	*								•		٠				٠					•	*				•
Cupressocyparis Leylandii	Leyland Cypress		•			٠						•			٠	•			•				•	٠	٠	٠		
Cupressus Sempervinirens	"Indica" Italian Cypress		•		٠							*			•	*				•			•	*		•		
Juniperus Chinensis	"Robustsa Green" Juniper		٠		٠							•			٠	٠				٠			•	٠				
Juniperus Scopulorum "Blue Heaven"	Rocky Mountain Juniper		٠		٠							٠			٠	٠		Γ		٠			٠	٠				
Magnolia Grandiflora	"St. Mary" Southern Magnolia		٠	٠					٠	٠		•		٠				٠			•		•					٠
Pinus Contorta	Shore Pine		•			•					•	*			•	٠				•			•	*				
Pinus Flexilis	"Vanderwolf's Pyramid" Limber Pine		٠	٠							•	*			٠	٠				*			•	*				
Pinus Nigra	Austrian Pine		•	٠		•					•	•			٠	٠				•			•	٠				
Pinus Ponderosa	Ponderosa Pine		٠			*					٠	*			٠	•				*			*	*				
Pinus Sylvestris	Scotch Pine		•			*					•	•			٠	٠				+			•	٠				
Pseudotsuga Menziesii	Douglas Fir		*			*						•		٠		•			*				•	*				
Thuja Occidentalis	"Emerald Green" Arborvitae		•		٠							•			*	*			•				•		•	*		
Thuja Plicata	Hogan Cedar		•			٠						•			•	•			•				•	•	*	*		
Thuja Plicata	Western Red Cedar		٠			٠					٠	•		٠				٠					٠	٠				
Tsuga Canadensis	Canada Hemlock		٠		*							•		•				*					•	٠				
Tsuga Heterophylla	Western Hemlock		•		•							*		•					•				•	•				
Tsuga Mertensiana	Mountain Hemlock		٠	٠								•		٠														
Abie's Grandis	Grand Fir		•		•							•		*					+				•	•	•			

PLANT SEI	LECTION	Ту	pe	G	row	th		Flowe	er	h	ntere	st]	Ligh	t		esis nt	M	Soil oistu	re				Fu	nctio	n		1
LIST Plant Materials Su		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name	_		(Char	racte	erist	ics						(Cult	ure								ι	Jse			
EVERGRE	EN SHRUBS																											
Arbutus Unedo	Strawberry Tree		•	•			•			•	•	•		•		•	•		•				•	•				
Arbutus Unedo "Compatica"	Compact Strawberry Tree		٠	٠			٠			٠	٠	٠		٠		٠	٠		٠				٠	٠				
Buxus Sempervirens	English Boxwood		*		*							•		*				*					*	•		•		
Ceanothus Thyrsiflorus	"Victoria" Ceanothus		•			•			٠	٠		٠			٠	٠				•			٠	٠			٠	
Chamaecyparis Obtusa "Nana"	Dwarf Hinoki False Cypress		*	*								*		٠				٠					٠	•				
Cistus X Hybridus	White Rockrose		•			•			•	•		•			•	•				•				٠			٠	
Cistus X Purpureus	Purple Rockrose		*			*			*	*		*			*	*				•				*			•	
Cotoneaster Parneyi	Parney Cotoneaster		٠			٠	٠					٠			٠	٠	٠			•			٠	٠			٠	
Daphne Cneorum	"Rugbyglow" Garland Daphne		٠		٠				٠	٠		٠			٠				٠					٠				
Elaeagnus Pungens	Pungent Elaeagnus		٠			٠	٠					٠		٠		٠			٠				٠	٠			٠	
Ilex Crenata	"Green Island" Japanese Holly		*		*							•		٠					•					٠		•		
Ilex Crenata	"Northern Beauty" Japanese Holly		٠		٠							٠		٠					٠					٠		٠		
Lavandula Stoechas	Spanish Lavendar		•		•			•		٠		•			*	•	•			*				٠			٠	
Lonicera Pileata	Privet Honeysuckle		*			*			*	•		*		•		*			*								•	
Mahonia Aquifolium	Oregon Grape		*			*			*	•		*		*		*	*		*				*	•		•	•	
Myrica Californica	Pacific Wax Myrtle		٠			٠						٠		٠		٠			٠					٠			٠	
Nandina Domestica	"Gulf Stream" Nandina		٠	٠				•				•		٠			٠		٠					٠			٠	
Osmanthus Delavayi	Delavay Osmanthus		٠		٠				٠	٠		٠			٠	٠			٠					٠				•
Paxistima Myrsinites	Oregon Boxwood		*		*							*			•	*			*					•				
Picea Abies "Nidiformis"	Bird's Nest Spruce		•	•								•		٠					•					٠				
Pieris Japonica	Montain Fire Andromeda		٠		٠				٠	٠		٠		٠				٠						٠				٠
Pinus Mugo "Pumilio"	Dwarf Mugo Pine		*	*								*		٠		*				•				٠				
Pittosporum Tobira	Wheelers Dwarf Pittosporum		•	•				•		٠		•		٠					*					٠				
Polystichum Munitum	Sword Fern		٠		٠							٠		٠					٠					٠				

PLANT SEI	LECTION	Ту	pe	G	rowt	th		Flow	er	I	ntere	st		Ligh	it		esis int	M	Soil oistu					Fun	ıctio	n		
LIST Plant Materials Sur	itability Section	Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name				(Cha	ract	eristi	cs			-				Cul	ture							ι	Jse			
EVERGRE	EN SHRUBS	- C	(O)	NT	IN	[U]	ED																					
Prunus Lauracerasus	"Otto Luyken" Laurel		•			•			٠	•		•		٠		•			•				•	•		•		
Prunus Laurocerasus	"Zabel" Laurel		٠			٠			٠	٠		•		٠		٠			٠				٠	•			٠	
Rhododendron	Anah Kruschkle Rhododendron		•	٠				•		٠		•			•			٠					٠	•				•
Rhododendron	Gomer Waterer Rhododendron		•	٠				٠		٠		•			٠			٠										٠
Rhododendron	Loder's White Rhododendron		٠	•				٠		٠		•			٠			•										•
Rhododendron	"Lucy Lou" Dwarf Rhododendron		•	*					٠	٠		*			٠			*						٠				
Rhododendron	"Myrtifolium" Dwarf Rhododendron		*	*				•		*		*			*			*						*				
Rhododendron	"PJM" Rhododendron		•	•					٠	*		•			•			•						•				
Rhododendron	"Purple Splendor" Rhododendron		•	•				٠		*		*	•		•			•					•	*				•
Rhododendron	Dwarf Rhododendron		•	٠					٠	٠		•	•		•			٠						•				
Rhododendron	Rosamundi Rhododendron		•	•					٠	٠		•		٠				•						•				٠
Rhododendron	Unique Rhododendron		٠	•					٠	٠		•		٠				•					•	•				
Rhododendron	Yakusimanum		•	•				٠		•		*		•				•						*				
Rosmarinus Officinalis	Rosemary		•			٠			•	٠		•			•	٠	•			*				•			•	
Sarcococca Ruscifolia	Fragrant Sarcococca		•		*				•	*		•	*						•					•				
Senecio Greyi	Senecio		•			•		•		*		*			•	٠			•					*				
Taxus Baccata "Repandens"	Spreading English Yew		•	•								•		٠		•				•				•			•	
Vaccinium Ovatum	Evergreen Huckleberry		•	٠								•		٠		٠			٠					•				
Viburnum Davidii	Davids Virburnum		•		•				•	•		•		•		•			•					•			•	
Viburnum Tinus	"Spring Bouquet" Laurustinus		•		٠		٠		٠	٠		•		٠		٠			٠				*	•		*		

Section: APPENDIX I W9126G-10-R-0103-0002

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DI ANT CEI	ECTION	Ту	pe	G	row	th	Fl	lowe	er	Ir	itere	est	1	Ligh	t		sist nt		Soil oistu	ıre				Fu	ncti	Pa on	ge 2	.29 o t
PLANT SEL LIST Plant Materials Sui		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name				Cl	hara	cter	istic	es							Cul	lture								Use			
DECIDUOL	US SCHRUBS	5																										
Amelanchier Alnifolia	Western Serviceberry				•				•	•		•		•		•			•					•				
Azalea Exgeny	Exbury Azalea	•			•				•	•	•	٠		٠					٠					•				•
Azalea Mollis	Azalea Mollis	•			•				•	•	*	•		•					•					•				•
Berberis Thunbergii	"Red Dwarf" Japanese Barberry	٠		•								٠			٠	٠			٠					•				
Berberis Thunbergii	"Crimson Pygmy" Japanese Barberry	•		•								•			•	•			•					•				
Berberis Thunbergii	"Rose Glow" Japanese Barberry	٠										٠			•	٠			*					•				
Caryopteris X Clandonensis	Bluebeard	•			•		٠	•				•			•	•			•					•				
Cornus Stolonifera	Redtwig Dogwood	*				•		•			•			•		•			•				•	•				
Cornus Stolonifera	"Silver & Gold" Dogwood	•				•		*			•	•		•		•			•					•				
Cotoneaster Horizontalis	Rock Cotoneaster	*			•				٠		٠	٠			٠	•	٠		•					•				
Enkianthus Campanulatus	Enkianthus	*		•					٠	•	•	•	•					•						•				•
Euonymus Alata "Compacta"	Compact Burning Bush	٠				•					٠	٠			٠	•			٠					•			•	
Hamamelis X Intermedia	"Diane" Witchhazel	•			•				٠	•		٠		٠				٠						•				•
Holodiscus Discolor	Ocean Spray	•			•			*		•		•		*		•				•				•				
Hydrangea Macrophylla	"Lacecap" Hydrangea	*				•		•		•		•	•					٠					•	•				
Oemleria Cerasiformis	Indian Plum	٠			*				٠	•		٠		*				٠						*				
Philadelphus Lewisii	Mock Orange	•				•		*		•		•			*				*				•	•				
Potentilla Fruticosa	Shrubby Cinquefoil	•			*			*		•		٠			*	•				•				•			•	
Rhus Glabra	Smooth Sumac	•						•			•	•			•	•				•				•			•	
Rhus Typhina "Laciniata"	Cutleaf Sumac	٠						*			٠	٠			٠	٠				٠				•			*	•
Ribes Aureum	Golden Currant "Red Flowering"	*				•			•	♦		•		•		•				•				•			*	
Ribes Sanguineum	Currant "Elk River Red"	٠				*			*	•		*		*		•				•				*			•	
Ribes Sanguineum	Currant	*				*			*	<u> </u>		*		•		•				*				*			•	
Rosa Rugosa	Ramanas Rose Wood's Rose	*				*		*	•	*		•			*	•	•		•	•				*		•	•	•
Rosa Woodsii Spirea Nipponica	"Snowmound"	•			•			•		•		•		•	_	•			•					•				•
Symphoricarpos Albus	Spirea Common Strawberry	•			٠			•		•		•		•		•				٠				•			•	
Syringa Meyeri "Palibin"	Dwarf Korean Lilac	•			•				•	•		•			•	•			•					•				•
Viburnum Tomentosum "Mariesii"	Doublefile Viburnum	•				•			٠			•		•		•			•				•	•				•

		T	ype	G	row	th	F	lowe	er	In	itere	est	1	Light		Ro sta		М	Soil oistu	re				Func	tion			
PLANT SEI LIST Plant Materials Su		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name		7		Cl	nara	cter	istic	:S						(Cult	ure							Us	se			
	COVERS/VIN		5							•									•									
Ajuga Reptans Arctostaphylos	Carpet Bugle	•				*		•		•		•		•					•									
Uva Ursi "Vancouver Jade"	Kinnikinnick		٠	٠					٠	•		٠			٠	٠				٠							٠	
Calluna Vulgaris	"Aurea" Heather		•					•		•		•			•				•					•			•	
Calluna Vulgaris	"Corbet Red" Heather		٠		٠			•		•		•			٠				•					•			٠	
Calluna Vulgaris	"Robert Chapman" Heather		•		•			٠		•		٠			•				•					•			٠	
Clematis	Evergreen					•			•	•		٠			•				•									
Armandii Clematis Montana "Rubens"	Clematis Deciduous Clematis	•				•			•	•		•			•				•									
Cotoneaster	Bearberry		•			•			•			•			•	•				•							•	
Dammeri	Cotoneaster "Mediterranean		_			_			_			_			_	_				_							Ľ	
Erica Carnea	Pink" Heath		*	•					•	•		•			*				•								•	
Erica Carnea	"Springwood White" Heath		٠	٠					•	•		•			*				•								•	
Erica Carnea	"Winter Beauty" Heath		٠	•					•	•		•			*				•								•	
Euonymus Fortunei "Colorata"	"Purple Leaf" Wintercreeper		•			٠						٠		•					*									
Euonymus Fortunei	"Kewensis" Wintercreeper		•			٠						٠			٠	٠			•									
Fragaria Chiloensis	Sand Strawberry		•			•			•	•		•				٠			•								•	
Gaultheria Shallon	Salal		•		•				•			•		•		*											•	
Hydrangea Petiolaris	Climbing Hydrangea	•				•		•		•		•		•				•										
Hypericum Calycium	St. Johnswort		•			٠		•		•		•			٠	٠			•								•	
Juniperis Conferta "Blue Pacific"	Shore Juniper		•		•							•			٠	٠				٠				•			•	
Juniperis Horizontalis	"Blue Chip" Juniper		•		•							•			٠	٠				٠				•			•	
Juniperis Horizontalis	"Prince of Wales" Juniper		٠		٠							٠			٠	٠				٠				•			٠	
Juniperis Horizontalis	"Wilton" Juniper		•		٠							٠			٠	٠				٠				•			٠	
Juniperis Procumbens	"Green Mound Garden" Juniper		•		٠	_	_	_	_		_	٠			٠	٠				٠	_	_		•			٠	
Juniperis Sabina	"Braodmoor" Juniper		•		•							•			•	•				•				•			•	

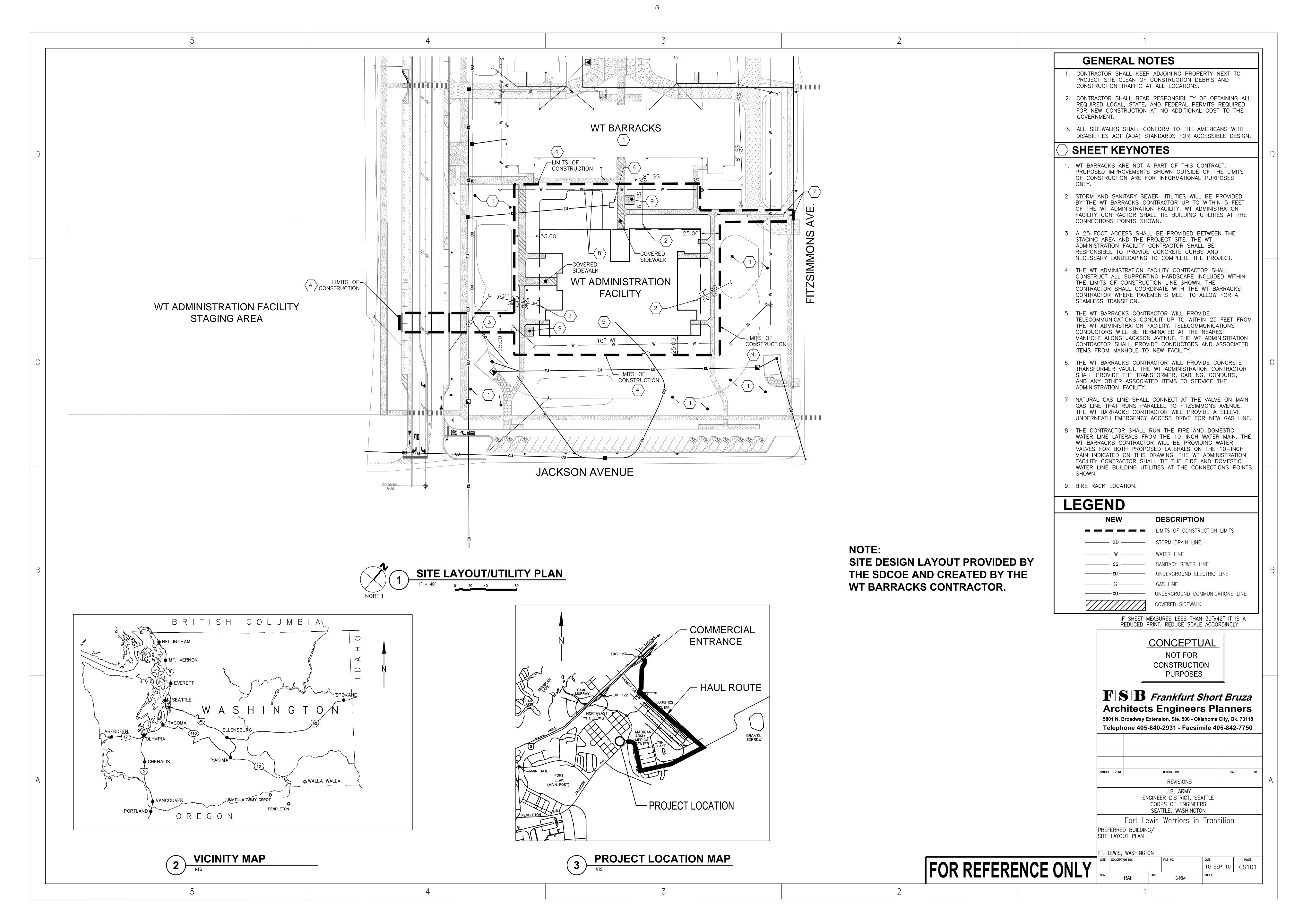
		T	ype	G	row	th	F	low	er	In	teres	it		Light	:	Res		M	Soil loistu	re				Fun	etior	,		
PLANT SELI LIST Plant Materials Suita		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name					Cha	arac	teri	stics							Cı	ıltur	·e						U	se			
GROUND C	OVERS/VIN	IES	S - (CO	NT	ΓIN	NU:	ED)																			
Mahonia Nervosa	Longleaf Mahonia		•		•				•	•		•		•		•				•							•	
Mahonia Repans	Creeping Mahonia		٠		٠				٠	•		٠		٠		•				٠							*	
Pachysandra Terminalis	Japanese Spurge		٠	٠					•			٠	٠					•										
Rosmarinus Officinalis "Prostratus"	Creeping Rosemary		٠			٠			•	٠		٠			٠	•	٠			٠							*	
Rubus Calycinoides "Emerald Carpet"	Creeping Raspberry		٠			٠			•	•		٠		•					•								•	
Sarcococca Hookeriana "Humilis"	Low Sweetbox		٠		٠				٠			٠	•						•									
Thymus Pesudolanuginosus	Wooly Thyme		٠		٠			٠				*			•	•			•									
Thymus Serphyllum	Wild Thyme		٠		٠			٠				٠			٠	•			•									
Vinca Minor	Dwarf Periwinkle		•			•			•	•		•		•					•								•	

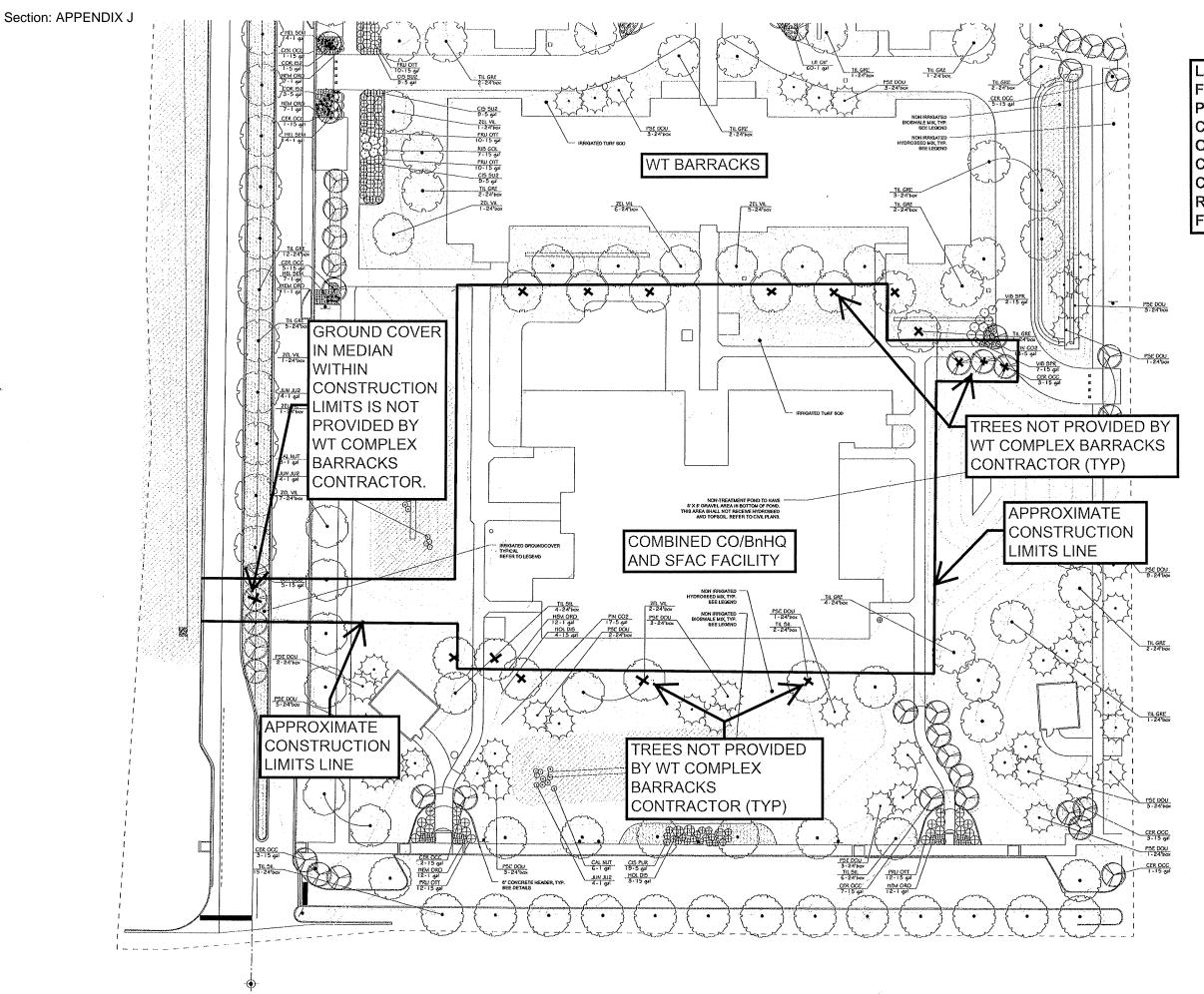
DI ANTE CEI	ECTION	T	ype	G	row	th	F	lowe	r	In	itere	est		Ligh	t	Ro sta	esi int	М	Soi Ioist					Fu	nctio	n		
PLANT SEL LIST Plant Materials Sui		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name				C	hara	ictei	istic	s							Cu	lture	e							Use			
	& PERENNI	ΑI	S																									
Acorus Gramineus "Ogon"	Sweetflag		•		٠							•			*			*						•				
Carex Morrowii "Aureo Variegata"	Variegated Sedge			٠								٠		٠				٠										
Epimedium Grandiflorum "Rose Queen"	Bishop's Hat								•	•		•		٠		٠			*									
Epimedium X Rubrum	Bishop's Hat					+			*	•		*		٠		٠			٠									
Geranium SP.	Cranesbill					*		•		•		•		•					•									
Helictotrichon Sempervirens	Blue Oat Grass		٠			*			٠	•		*			٠	٠												
Hemerocallis Sp.	Daylily					•		•		*		•			*	٠												
Heuchera Micrantha	"Palace Purple" Coral Bells				٠			•		•		*	٠						٠									
Hosta Sp.	Plantain Lily			•				•		•		•	٠					•										
Liatris Spicata "Kobold"	Gayfeather					*		•		*		*			٠	٠			٠									
Liriope Muscari	Big Blue Lilyturf			•								•	•						*									
Lithodora Diffusa	"Grace Ward" Lithodora					*		•		*		*			٠	٠				٠							+	
Miscanthis Sinensis	"Yaku Jima" Silver Grass					•		•		*		•		٠					*								+	
Miscanthis Sinensis "Zebrinus"	Zebra Grass					•		•		•		•		٠					•								•	
Ophiopogon Japonicus "Nana"	Dwarf Mondo Grass			*				•				*	•						•									
Pennisetum Alopecuroides	Fountain Grass				٠			•		•		•		*					*									
Sedum Spurium	"Dragon's Blood" Stonecrop					•		•		•		•		•		٠				•								
Veronics Peduncularis	"Georgia Blue" Speedwell				•				•	•		•			•				•									

Links

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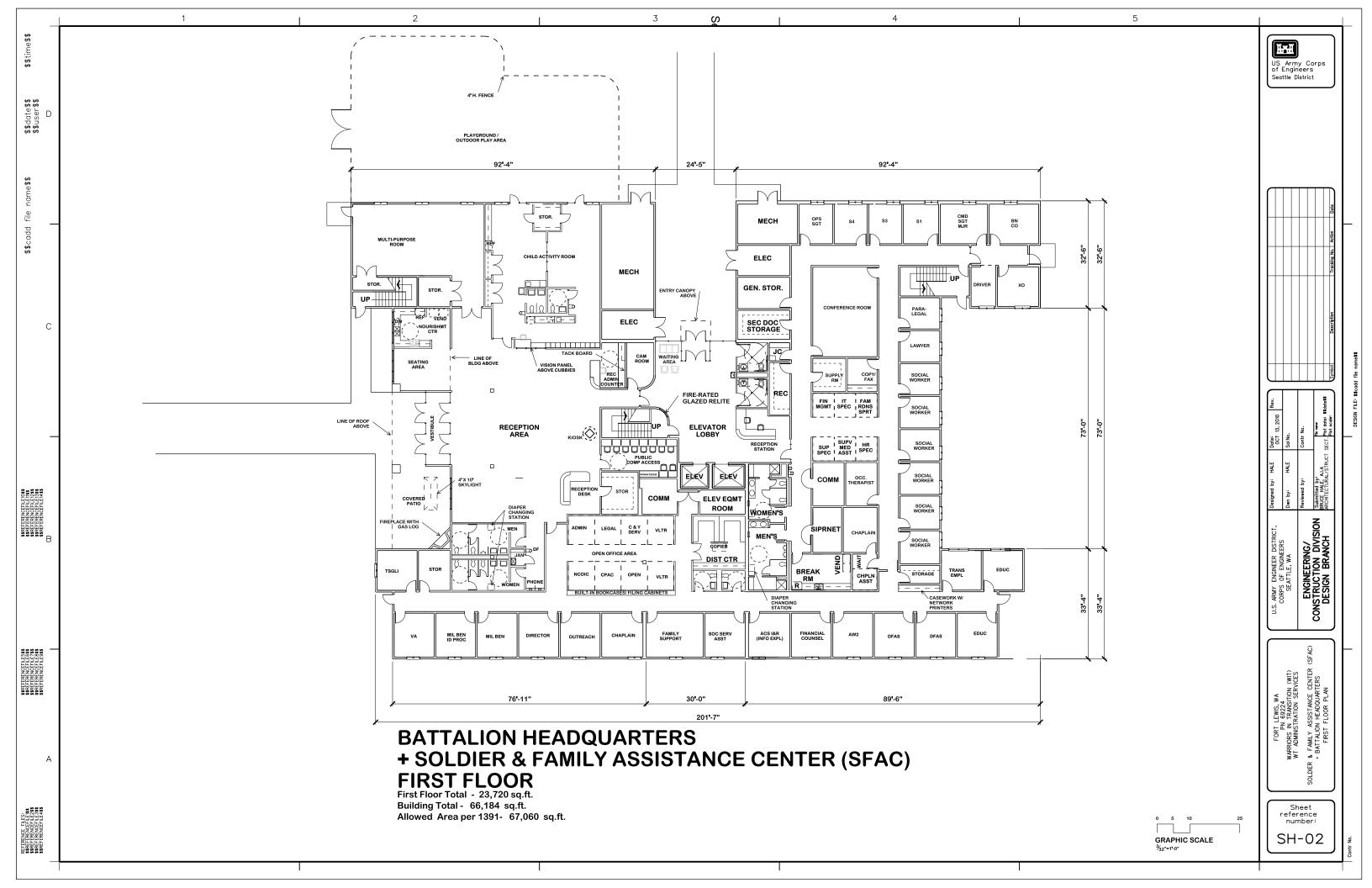


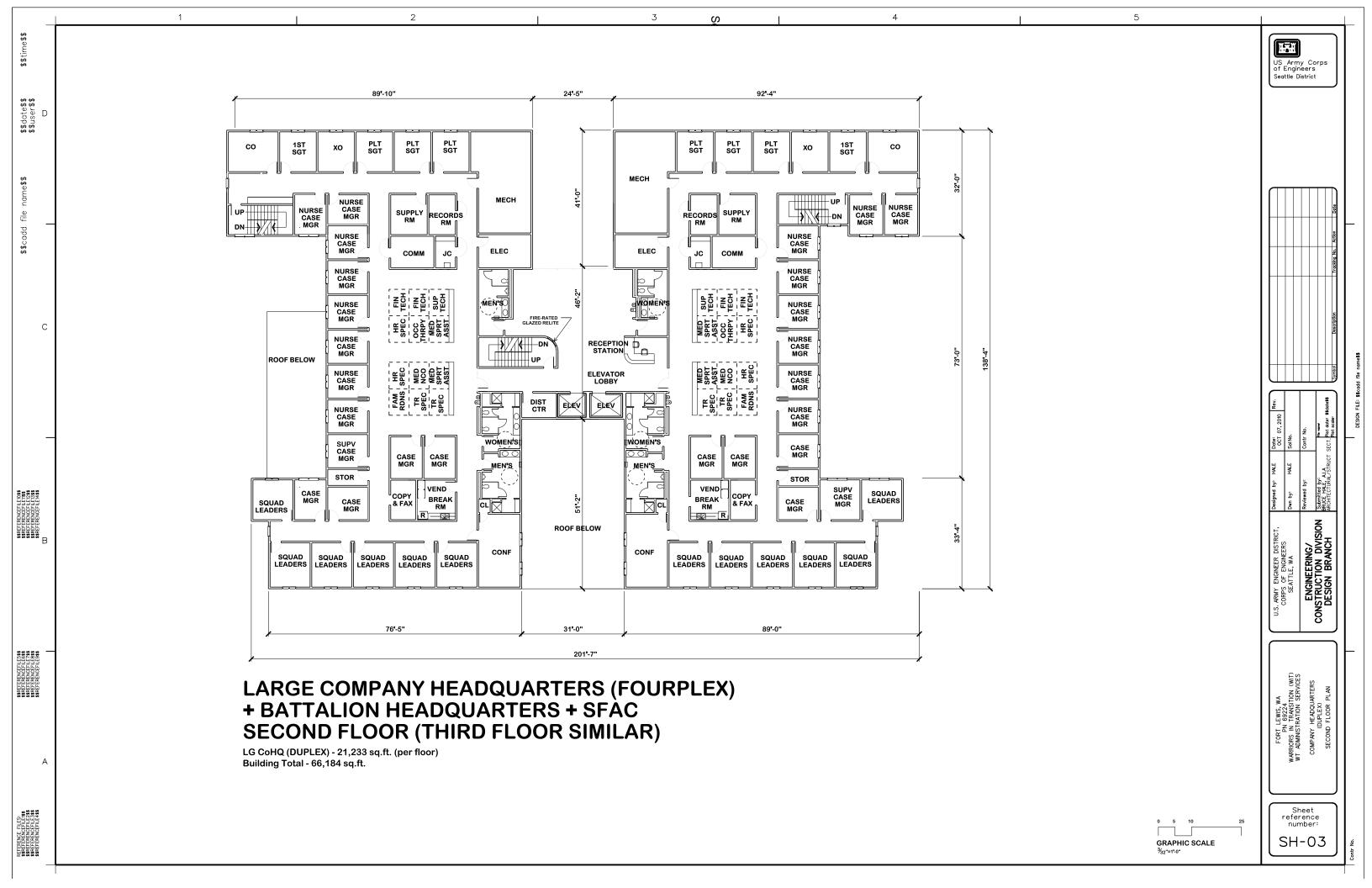


LANDSCAPE PLAN SHOWN IS AN EXCERPT FROM OVERALL SITE LANDSCAPE PLAN PROVIDED BY WT COMPLEX BARRACKS CONTRACTOR AND IS FOR INFORMATION ONLY. LANDSCAPE WITHIN CURRENT COMBINED CO/BnHQ AND SFAC FACILITY CONSTRUCTION LIMITS IS THE RESPONSIBILITY OF THE COMBINED FACILITY CONTRACTOR.

LANDSCAPE PLANTING SKETCH

Section: APPENDIX J W9126G-10-R-0103-0002 Page 235 of 572 IRRIGATION PLAN SHOWN FOR INFORMATION ONLY. IRRIGATION WITHIN CURRENT COMBINED CO/BnHQ AND HAH SFAC FACILITY CONSTRUCTION LIMITS IS THE RESPONSIBILITY OF THE COMBINED FACILITY CONTRACTOR US Army Corps of Engineers Seattle District 4" SL **IRRIGATION NOT** PROVIDED BY WT COMPLEX **IRRIGATION NOT** BARRACKS PROVIDED BY WT CONTRACTOR NOTE:
TURF AREAS AROUND BUILDINGS SHALL BE
IRRIGATED WITH A TEMPORARY ABOVE GROUND
SYSTEM. VALVES SHOWN WITH NO LATERAL
UNE ARE RESERVED FOR THE TEMPORARY
TURF IRRIGATION. (TYPICAL) COMPLEX BARRACKS CONTRACTOR COMBINED CO/BnHQ AND SFAC FACILITY BB VK-0-8 1 15 GRADE GRADE **IRRIGATION NOT PROVIDED** IRRIGATION NOT PROVIDED BY WT COMPLEX BARRACKS BY WT COMPLEX BARRACKS CONTRACTOR CONTRACTOR BROOKWATER IRRIGATION CONSULTANTS
FIVE CROW CANYON COURT, SUITE 209
SAN RAMON, CALIFORNIA 94593
TEL932-855-017-FAX 925-855-037
E-MAIL BROOKWATER-BROOKWATER.COM T LEWIS, WASHING IN TRANSITION I PN 69224, FYD9 Sheet Reference Number: REFER TO SHEET LS504 AND LS505 FOR IRRIGATION DETAILS AND SHEET LS002 FOR IRRIGATION LEGEND AND NOTES. LS201A SCALE: 1" = 20'-0" Sheet 53 of 558 Tuesday, October 26, 2010





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APPENDIX K Life Cycle Cost Analysis Fuel Cost Information (REV 1.1, 28 Mar 2008)

The following utility rates for this installation are provided for the purpose of performing life cycle cost calculations in response to this solicitation and for design development in accordance with Section 01 33 16 Design After Award:

Electrical:

Demand Charge - \$3.61 per kilowatt

Energy Charge - \$ 0.030389 per kilowatt-hour (at Substation)

Blended Rate - \$ 0.03684 per kilowatt-hour (blended annual energy and demand cost)

(this rate includes a delivery charge)

Natural Gas:

Commodity Charge Rate - \$ 1.24 per therm

Commodity Charge Rate - \$ 0.91 per therm (for interruptible service only-interruptible rate

requires availability of secondary fuel source. North Fort Lewis uses an air/propane fuel system installed parallel

with natural gas service.)

Water:

Commodity Charge Rate - \$1.296 per thousand gallons

Sewer:

Commodity Charge Rate - \$2.2707 per thousand gallons

Purchased/Central Steam:

Not Applicable to this project

Purchased High Temperature Water:

Not Applicable to this project

Purchased Chilled Water:

Not Applicable to this project

APPENDIX L

LEED Project Credit Guidance (MAY 10)

This spreadsheet indicates Army required credits, Army preferred credits, project-specific ranking of individual point preferences, assumptions guidance for individual credits, and references to related language in the RFP for individual credits.

LEED Credit Paragraph	LEED Project Credit Guidance	Army Guidance: Required - Preferred - Avoid	Project Preference Ranking: (1=most preferred, blank=no preference, X=preference not applicable to this credit, Rqd=required)	
PAR	FEATURE		<u></u>	REMARKS
SUSTAINABLE SITES				
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
SS1	Site Selection	riqu	Х	See paragraph LEED CREDITS COORDINATION.

SS2	Development Density & Community Connectivity - OPTION 1 DENSITY		X	See paragraph LEED CREDITS COORDINATION.
	Development Density & Community Connectivity - OPTION 2 CONNECTIVITY		Х	See paragraph LEED CREDITS COORDINATION.
SS3	Brownfield Redevelopment		X	See paragraph LEED CREDITS COORDINATION.
SS4.1	Alternative Transportation: Public Transportation Access		X	See paragraph LEED CREDITS COORDINATION.
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	Pref		Assume that non- transient building occupants are NOT housed on Post unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 1			Requires provision of vehicles, which cannot be purchased with construction funds. Assume Government will not provide vehicles unless indicated otherwise. Assume that 50% of GOV fleet is NOT alternative fuel vehicles unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 2	Pref		
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 3			Requires provision of vehicle refueling stations. Installation must support type of fuel and commit to maintaining/supporting refueling stations.
SS4.4	Alternative Transportation: Parking Capacity	Pref		

	Site Development: Protect or			
SS5.1	Restore Habitat			
				Assume AGMBC option
				for aggregated open space at another location
				on the installation is not
	Cita Davidana anti Marini a Onca			available to the project
SS5.2	Site Development: Maximize Open Space	Pref		unless indicated otherwise.
000.2	Opado	1 101		See paragraph
•••		_ ,		STORMWATER
SS6.1	Stormwater Design: Quantity Control	Pref		MANAGEMENT.
				See paragraph STORMWATER
SS6.2	Stormwater Design: Quality Control	Pref		MANAGEMENT.
SS7.1	Heat Island Effect: Non-Roof			
				Coordinate with nearby
				airfield requirements, which may preclude this
SS7.2	Heat Island Effect: Roof	Pref		credit.
SS8	Light Pollution Reduction	Pref		
WATER EFFICIENCY		1	1	T
	Water Use Reduction (Version 3			All LEED prerequisites
WEPR1	only)	Rqd	Rqd	are required to be met.
				See paragraph IRRIGATION. Project
				must include landscaping
	Water Efficient Landscaping:			to be eligible for this
WE1.1	Reduce by 50%	Pref		credit.
	Water Efficient Landscaping: No			Project must include landscaping to be eligible
WE1.2	Potable Water Use or No Irrigation	Pref		for this credit.
	Innovative Wastewater			
WE2	Technologies - OPTION 1			
	Innovative Wastewater			
WE2	Technologies - OPTION 2			
				See paragraph
WE3	Water Use Reduction	Pref		BUILDING WATER USE REDUCTION.
	Trater 500 Reduction	1 101		1120011014

ENERGY AND ATMOSPHE	DE			
ENERGY AND ATMOSPHE EAPR1	Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR2	Minimum Energy Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR3	Fundamental Refrigerant Management (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EA1	Optimize Energy Performance	Rqd	1	Earning of LEED EA1 points as indicated in paragraph ENERGY CONSERVATION, as a minimum, is required.
EA2.1	On-Site Renewable Energy	Pref		See paragraph ENERGY CONSERVATION.
EA3	Enhanced Commissioning	Rqd		See paragraph COMMISSIONING. The Commissioning Authority may be provided through the Design-Build Contractor only if in accordance with USGBC Credit Interpretation Ruling (CIR) dated 9/15/06. Commissioning Authority activities begin during design phase and continue well beyond beneficial occupancy. Assume Government will not provide CxA post- occupancy activities unless indicated otherwise.
EA4	Enhanced Refrigerant Management			
EA5	Measurement & Verification			Assume Government will not provide post-occupancy activities unless indicated otherwise.
EA6	Green Power		Х	See paragraph LEED CREDITS COORDINATION.

MATERIALS AND RESOUR	CES			
MRPR1	Storage & Collection of Recyclables (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Coordinate with Installation during design development on collection service and receptacles.
WINT IXI	(FRENE GOINE)	rtqu	rtqu	Service and receptacies.
MR1	Building Reuse			
MR2.1	Construction Waste Management: Divert 50% From Disposal	Pref		See paragraph CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.
MR2.2	Construction Waste Management: Divert 75% From Disposal	Pref		
MR3	Materials Reuse			
TVITCO	iviatoriais ixeuse			
MR4.1	Recycled Content: 10% (post- consumer + 1/2 pre-consumer)	Pref		See paragraph RECYCLED CONTENT.
MR4.2	Recycled Content: 20% (post- consumer + 1/2 pre-consumer)	Pref		
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally			
MR5.2	Regional Materials:20% Extracted, Processed & Manufactured Regionally			

MR6	Rapidly Renewable Materials Certified Wood	Pref Pref		See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS and paragraph FEDERAL BIOBASED PRODUCTS PREFERRED PROCUREMENT PROGRAM. See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS.
INDOOR ENVIRONMENTA				
EQPR1	Minimum IAQ Performance (PREREQUISITE)	Rad	Rqd	All LEED prerequisites are required to be met.
EQPR2	Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Assume all buildings are smoke free unless indicated otherwise (family housing, barracks and other lodging are facility types where smoking may be permitted in some cases).
EQ1	Outdoor Air Delivery Monitoring			
EQ2	Increased Ventilation			
EQ3.1	Construction IAQ Management Plan: During Construction	Pref		See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ3.2	Construction IAQ Management Plan: Before Occupancy	Pref		See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ4.1	Low Emitting Materials: Adhesives & Sealants Low Emitting Materials: Paints &	Pref		See paragraph LOW- EMITTING MATERIALS. See paragraph LOW-
EQ4.2	Coatings	Pref		EMITTING MATERIALS.
EQ4.3	Low Emitting Materials: Carpet/Flooring Systems	Pref		See paragraph LOW- EMITTING MATERIALS.

EQ4.4	Low Emitting Materials: Composite Wood & Agrifiber Products	Pref		See paragraph LOW- EMITTING MATERIALS.
				System requiring weekly cleaning to earn this
	Indoor Chemical & Pollutant Source			credit is not a permitted option unless indicated
EQ5	Control	Pref		otherwise.
EQ6.1	Controllability of Systems: Lighting			
EQ6.2	Controllability of Systems: Thermal Comfort			
F07.4	Thormal Comforts Design	Dad		See paragraph HEATING, VENTILATING AND AIR
EQ7.1	Thermal Comfort: Design	Rqd		CONDITIONING. Project must earn credit
				EQ7.1 to be eligible for this credit. Assume Government will not
EQ7.2	Thermal Comfort: Verification			provide post-occupancy activities unless indicated otherwise.
EQ8.1	Daylight & Views: Daylight 75% of Spaces	Pref		See paragraph DAYLIGHTING.
	Daylight & Views: Views for 90% of			
EQ8.2	Spaces	Pref		
INNOVATION & DESIGN PR	ROCESS			
				See paragraph INNOVATION AND DESIGN CREDITS. Assume Government will not provide any activities associated with ID
IDc1.1	Innovation in Design			credits.
IDc1.2	Innovation in Design			
IDc1.3	Innovation in Design			
IDc1.4	Innovation in Design			
IDc2	LEED Accredited Professional	Rqd	Rqd	LEED AP during design and construction is required.
REGIONAL PRIORITY CREDITS (Version 3 only)		,	•	See paragraph LEED CREDITS COORDINATION.

Appendix M

Owner's Project Requirements Document for LEED Fundamental Commissioning

Project:			
Approved:	Name	Owner's Representative	Date
	Name	Design Agent's Representative	Date

Overview and Instructions

The purpose of this document is to provide clear and concise documentation of the Owner's goals, expectations and requirements for commissioned systems, and shall be utilized throughout the project delivery and commissioning process to provide an informed baseline and focus for design development and for validating systems' energy and environmental performance.

The Owner's Project Requirements Document is a required document for LEED-NC EA Prerequisite Fundamental Commissioning of the Building Energy Systems. It shall be completed by the Corps District/Design Agent based on coordination with the Installation/User/Proponent and shall be approved by the Installation/User/Proponent representative.

The intent of the Owner's Project Requirements Document is to detail the functional requirements of a project and the expectations of the building's use and operation as it relates to commissioned systems. This template contains the basic recommended components indicated in the LEED Reference Guide. It should be adapted as needed to suit the project, remaining reflective of the LEED intent.

The Owner's Project Requirements Document should ideally be completed before the start of design and furnished to the design team. It must be completed prior to the approval of Contractor submittals of any commissioned equipment or systems to meet LEED requirements.

Updates to the Owner's Project Requirements Document throughout the course of project delivery shall be made by the Corps District/Design Agent based on decisions and agreements coordinated with and agreed to by the Installation/User/Proponent.

The Owner's Project Requirements Document shall be included in the project's LEED documentation file under EA PR1, Fundamental Commissioning of the Building Energy Systems.

Owner's Project Requirements Document for LEED Fundamental Commissioning Table of Contents

- 1. Owner and User Requirements
 - Primary Purpose, Program and Use
 - Project History
 - Broad Goals
- 2. Environmental and Sustainability Goals
 - Energy Efficiency Goals
 - General
 - Siting
 - Building Façade
 - Building Fenestration
 - Building Envelope
 - Roof
 - Other
- 3. Indoor Environmental Quality Requirements
 - Intended Use
 - Occupancy Schedule
 - Accommodations for After-Hours Use
 - Lighting, Temperature, Humidity, Air Quality, Ventilation, Filtration
 - Acoustics
 - Occupant Ability to Adjust System Controls
 - Types of Lighting
- 4. Equipment and Systems Expectations
 - Space Heating
 - Ventilation
 - Air Conditioning
 - Refrigeration
 - HVAC Controls
 - Domestic Hot Water
 - Lighting Controls
 - Daylighting Controls
 - Emergency Power
 - Other
- 5. Building Occupant and O&M Personnel Requirements
 - Facility Operation
 - EMCS
 - Occupant Training and Orientation
 - O&M Staff Training and Orientation

TABLE 1

Owner and User Requirements	
at is the primary purpose, program and use of this project? (example: office building with dat	ta c
	-
cribe pertinent project history. (example: standard design development)	-
pad Goals	-
at are the broad goals relative to program needs?	-
at are the broad goals relative to future expansion?	-
at are the broad goals relative to flexibility?	- - -
at are the broad goals relative to quality of materials?	- - -
at are the broad goals relative to construction costs?	- -
at are the broad goals relative to operational costs?	-
er broad goals: (Insert as applicable)	- - -

	onmental and Sustainability Goals
what are the rating)	project goals relative to sustainability and environmental issues? (example: LEED S
What are the	e project goals relative to energy efficiency? (example: Meet EPACT)
What are the	e project goals and requirements for building siting that will impact energy use?
What are the	project goals and requirements for building facade that will impact energy use?
What are the	project goals and requirements for building fenestration that will impact energy use
What are the	project goals and requirements for building envelope that will impact energy use?
What are the	project goals and requirements for building roof that will impact energy use?
Other: (Inser	rt as applicable)

3. Indoor Environmental Quality Requirements

What is the intended use for all spaces? For all spaces that have an intended use that is not readily apparent from the space name, provide this information in Table 1.
What is the anticipated occupancy schedule (numbers of occupants and time frames) for all occupied spaces? Indicate the default occupancy schedule below and for all spaces that have an occupancy schedule that differs from the default, provide this information in Table 1.
What accommodations for after-hours use are required? (example: access control, lighting controls, HVAC controls) Indicate general accommodations required below and for all spaces that have special requirements, provide this information in Table 1.
What are the lighting, temperature, humidity, air quality, ventilation and filtration requirements for all spaces? Indicate the default requirements below and for all spaces that have a requirement that differs from the default, provide this information in Table 1.
Lighting: Temperature:
Humidity:Air Quality:
Ventilation:
Filtration:
What are the acoustical requirements for all spaces? Indicate the default acoustical requirements below and for all spaces that have a requirement that differs from the default, provide this information in Table 1.
What is the desired level of occupant ability to adjust systems controls? Indicate the default desired levels below and for all spaces that have a desired level that differs from the default, provide this information in Table 1.
Lighting:

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Temperature:
Humidity:
Air Quality:
Ventilation:
What, if any, specific types of lighting are desired? (example: fluorescent in 2x2 grid, accent lighting, particular lamps)
4. Equipment and System Expectations
(Complete for each category as applicable or indicate "none identified" or "N/A". Add desired features information for other anticipated commissioned systems as applicable)
Indicate desired features for the following commissioned system: Space Heating
Desired Type:
Quality:
Preferred Manufacturer:
Flexibility:
Desired Technologies:
Indicate desired features for the following commissioned system: Ventilation Desired Type:
Quality:
Preferred Manufacturer:
Flexibility:
Desired Technologies:

Indicate desired features for the following commissioned system: Air Conditioning

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04 MAY 10

Desired Type:
Quality:
Preferred Manufacturer:
Reliability:
Automation:
Flexibility:
Maintenance Requirements:Efficiency Target:
Desired Technologies:
Desired Technologies.
Indicate desired features for the following commissioned system: Refrigeration
Desired Type:
Quality:
Preferred Manufacturer:
Reliability:
Automation:
Flexibility:
Maintenance Requirements:
Desired Technologies:
Indicate desired features for the following commissioned system: HVAC Controls
Desired Type:
Quality:
Preferred Manufacturer:
Reliability:
Automation:
Flexibility:
Maintenance Requirements:
Desired Technologies:
Indicate desired features for the following commissioned system: Domestic Hot Water
Desired Type:
Quality:
Preferred Manufacturer:
Reliability:
Automation:

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04 MAY 10

Flexibility:
Maintenance Requirements:
Efficiency Target:
Desired Technologies:
Indicate desired features for the following commissioned system: Lighting Controls
Desired Type:
Quality:
Preferred Manufacturer:
Reliability:Automation:
Flexibility:
Efficiency Target:
Desired Technologies:
2
In the decimal for the fall and a constitution of a state of the fall and a state of the constitution of the fall and a state of the state of the state of the state of the st
Indicate desired features for the following commissioned system: Daylighting Controls
Desired Type:
Quality:
Preferred Manufacturer:
Reliability:
Automation:
Flexibility:
Maintenance Requirements:
Desired Technologies:
Indicate desired features for the following commissioned system: Emergency Power
Desired Type:
Quality:
Preferred Manufacturer:
Reliability:
Automation:
Flexibility:
Maintenance Requirements:
Efficiency Target:
Desired Technologies:

04 MAY 10

5. Building Occupant and O&M Personnel Requirements How will the facility be operated? Who will operate the facility?
Preferred Manufacturer:
Reliability:
Flexibility: Maintenance Requirements: Efficiency Target: Desired Technologies: 5. Building Occupant and O&M Personnel Requirements How will the facility be operated? Who will operate the facility?
5. Building Occupant and O&M Personnel Requirements How will the facility be operated? Who will operate the facility?
Requirements How will the facility be operated? Who will operate the facility?
<u> </u>
Will the facility be connected to an EMCS? If so, what are the interface requirements? (example: monitoring points, control points, scheduling)
What is the desired level of training and orientation for building occupants to understand and use the building systems?
What is the desired level of training and orientation for O&M staff to understand and maintain the building systems?

Table 1

Space	Use / Activity	Num of Occs	Special Occupancy Schedule	After Hours Use Reqmt.	Special Cooling Reqmt.	Special Heating Reqmt.	Special Humidit y Reqmt.	Special Ventil./Filtration Reqmt.	Special Acoustic Reqmt.	Special Lighting Reqmt.	Special Occup Adjustability Reqmt.



Section: APPENDIX N

Build green. Everyone profits.

LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects

(AGMBC)

For use with the LEED-NC Green Building Rating System Versions 2.1 and 2.2

October 2005

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Introduction

The purpose of this Application Guide is to provide direction in applying the Leadership in Energy and Environmental Design® Green Building Rating System Versions 2.1 and 2.2 for New Construction and Major Renovations (LEED-NC) to projects in a campus or multi-building setting such as corporate campuses, college campuses, and government installations (i.e. there is one owner or common property management and control). The application guide is intended for projects where several buildings are constructed at once, in phases, or a single building is constructed in a setting of existing buildings with common ownership or planning with the ability to share amenities or common design features. Throughout this guide, the term "campus" is used to represent all of these permutations.

LEED-NC Rating System, Support Materials and Tools

LEED is a program of the U.S. Green Building Council (USGBC) that establishes performance goals in five environmental categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, and Indoor Environmental Quality. In addition, a sixth category, Innovation & Design Process, addresses those environmental issues not included in the environmental categories such as acoustics, community enhancement, education, and expertise in sustainable design. Many issues specific to campus projects that are not addressed by the existing credit structure may be included in the Innovation & Design Process category.

The rating system is supported by the LEED-NC Reference Guide, a document that provides additional information and guidance for each LEED Prerequisite and Credit. Consult the LEED-NC Rating System, Reference Guide and www.usgbc.org for more information on the LEED program, the LEED application process, and the USGBC.

Working in concert with the rating system and reference guide, the LEED-NC Submittal Template is a helpful tracking and documentation tool, as well as a required submittal for LEED certification. The Version 2.0 Calculator spreadsheets still remain helpful for some credits.

LEED-NC Application Guide for Multiple Buildings and On-Campus Projects

This Application Guide facilitates using LEED-NC as a performance standard for greening the design of a building or set of buildings within a campus setting (college, corporate, military, multi-use development, etc.), or a group of buildings certifying as a set. A project involving several buildings may be built all at once, or in phases. The latter is especially applicable to large developments.

The Application Guide provides an opportunity for building owners to reduce the environmental impact of buildings by approaching green building in a broader context. Opportunities for reducing environmental impact may be spread over several buildings, a complex of buildings, or an entire campus or installation. Credits are available to each building that benefits from the shared amenities. This approach allows for economies of

scale, enabling more opportunities to reduce the environmental impact of buildings and infrastructure.

The Application Guide analyzes the intent of each LEED-NC credit and prerequisite as developed for commercial facilities and interprets them for campus and installation projects. The greatest opportunities for new interpretations arise in credits associated with Sustainable Sites, Water Efficiency, and Energy and Atmosphere. Materials and Resources and Indoor Environmental Quality credits have fewer campus-specific interpretations and remain mostly the same as LEED-NC, merely requiring aggregation of performance results. The total points available under this guide are the same as LEED-NC v2.1 and 2.2 with no new credits added to or deleted from the basic rating system.

This application guide interprets and supplements the LEED criteria for projects. Where appropriate and unique to the campus or multiple building environment, alternative campus requirements and submittals that meet the intent of the basic rating system are provided. The LEED-NC Rating System and the Reference Guide are the governing documents for all LEED certification applications.

The LEED Multiple Buildings and Campus Committee

The LEED Steering Committee instructed the Multiple Buildings and Campus Committee to create an application guide that would be a simple overlay onto LEED-NC. Although simple in concept, this guide will assist many LEED projects – e.g. at the time of release, approximately 7% of all LEED registered project square footage is that of higher education facilities, which is just one of the sectors served by the guide. The MB&C Committee's ultimate desire is a LEED rating system that can be used to certify entire campuses and military installations in order to more thoroughly impact these market sectors.

USGBC gratefully acknowledges the following committee members (past and present) for their contributions to this document.

Don Fournier (Chair) University of Illinois Building Research Council

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Joel Stout University of Cincinnati, Division of the University Architect Section: APPENDIX N W9126G-10-R-0103-0002 Page 261 of 572

Overview

How to Use the Application Guide

This Application Guide is designed to complement the LEED-NC Green Building Rating System and the LEED-NC Reference Guide. The prerequisites and credits are supplemented, where necessary, by alternative Requirements and Submittals in order to apply the rating system to on-campus projects and multiple-build projects. Credit requirement alternatives in this Application Guide may be used instead of the regular LEED-NC requirements, but are not mandatory as they may not apply in all situations. The USGBC's CIR process also applies to this Application Guide and its requirements.

If appropriate, each prerequisite or credit includes Application Guidance with a discussion of related technologies and strategies. The Application Guide should be used as a working document that is referenced frequently throughout the design process.

Campus and Multiple Building Issues

The most detailed application guidance is necessary in the Sites category, as it presents the most challenges. Most credits in other categories simply allow the option of aggregate calculations. Campus settings sometimes have established property lines between segments of the campus, but share a common infrastructure between areas. Street lighting within a campus (e.g., lighted walkways) may technically encroach upon an adjacent property within the campus boundary. Similarly, stormwater from the campus may enter into a common retention pond or treatment facility specifically built for the campus. The use of natural treatment processes and distributed approaches are encouraged in the campus setting. The campus may own a wastewater treatment system and utilize the gray water for irrigation purposes. Streets and right of ways may be turned over to the local government after completion. Infrastructure and common amenities can be shared in campus settings and may contribute to performance achievement, thus helping to capture LEED points. The approach must be consistently applied across the project and all such cases are carefully scrutinized by the USGBC.

Some campus and multiple building projects may be mixed use development where the campus is developing a portion of the project and a separate party (or parties) is developing the remainder of the project. In such cases, the campus entity may define the LEED scope in such a way as to omit buildings that will be built by a separate party. This choice should be made with due consideration of the issues and projects are advised to keep omissions within the site boundaries to reasonable limits, in particular to parts of the overall project over which the project team will not have control. When the project is one building, the parts of the building within the campus entity's scope must meet LEED requirements. It is recommended that these buildings demonstrate that specific steps have been taken and guidance provided to insure that future buildout can also meet LEED requirements. The development of a thorough and instructive set of design guidelines and recommendations, coupled with building infrastructure to

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support future LEED build-outs, is encouraged to ensure that the building will perform as a LEED building after build-out.

The Certification Process for Multiple Buildings and within Campus Settings

Any project team utilizing this guide simply registers its project under the standard LEED-NC program. A project already registered can choose to use the application guide at any time before certification submittal, but should do so as early as possible during the pre-design or design stage.

*** **Note:** The following certification processes are in pilot phase, and may be revised at any time. The most up-to-date version will be posted on the Web site along with this application guide. ***

There are three approaches to certifying buildings in the campus or installation setting:

- Certifying a new building within a setting of existing buildings that are considered a campus, i.e. there is one owner or common property management and control.
- Certifying a group of new buildings as a package where the entire building set will be rated as a package and only one rating received. These buildings may constitute the entire campus or be a subset of an existing campus.
- Certifying new buildings where each new building is constructed to a set of standards but will receive an independent rating based on achievement of credits beyond the standards specific to that building. These buildings may constitute the entire campus or be a subset of an existing campus.

Each of these approaches will be discussed separately and registration and certification provided for that particular approach.

Certifying a new building within a setting of existing buildings

The certification process is essentially the same as the LEED-NC certification process for the given building. When certifying a single building under the Application Guide, you may choose campus requirements and submittals in lieu of the standard LEED-NC requirements and submittals where unique aspects of the campus setting have an impact on the credit affecting the building, e.g. where stormwater management practices are campus-wide rather than building-specific.

A reasonable and logical "LEED project site" boundary must be defined for LEED purposes. The project scope of work and the site area affected by the construction generally suffice to inform this definition. The defined site must remain consistent for all LEED credits. The Application Guide provides details on special considerations for shared amenities such as parking (adjacent and, more often, remote) and open space.

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Certifying a group of new buildings as a package where the entire building set will be rated as a package and only one rating received

For entities that construct a set of buildings at once or over a defined time period in a campus setting, certification of each building individually could result in excessive documentation, much of which would be duplicated between buildings. In this case the option of rating the entire building set may be the best choice. When certifying a set of buildings under the Application Guide, you may choose campus requirements and submittals in lieu of the standard LEED-NC requirements and submittals where unique aspects of the campus setting impact the credit affecting the buildings. The Application Guide provides the methods for calculations and submittals for credits that may be averaged across the set of buildings and defines which credits must be met by each individual building. Using the averaging techniques, where applicable, allows for one rating to be applied to the building set, thereby minimizing documentation. Identify the group of buildings with a single name for LEED registration and certification.

Certifying new buildings where each new building is constructed to a set of standards but will receive an independent rating based on achievement of credits beyond the standards

1. Many campus build entities establish design standards (e.g. campus master plans and specifications) that will be applied repeatedly to new buildings. These elements may be site- or building-specific. The campus build process allows applicants to certify a "prototype" credit set that is intended for repetition on subsequent projects. The total credits beyond the standards may vary from building to building. Project teams will be permitted to designate prerequisites as prototypes.

2. Certification Review for the First Project:

- a. USGBC shall conduct a thorough and complete review of the first project, including prototype credits.
- b. The certification submittal shall include all supporting background information for prototype prerequisites/credits, and specific guidance will be developed for these requirements (similar to that created for LEED-NC audits).
- c. Projects will receive a Preliminary and Final LEED Review for all prerequisites/credits pursued, following the published review process.
- d. The Appeal process shall be an option for any prerequisite/credit which is part of this first project.

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> e. All approved prototype prerequisites/credits will be designated as such in the Final or Appeal LEED Review of this first project. Any denied prototype prerequisite/credit shall not be included in the prototype set.

3. Certification Reviews For Subsequent Project(s):

- a. Subsequent projects shall be reviewed per the current process, which includes up to six prerequisites/credits selected for audit. It will be at the discretion of the review team whether or not a prototype credit will be selected as one of the up to six for audit.
- b. These projects will not be required to submit documentation on approved prototype prerequisites/credits unless selected for audit in the Preliminary LEED Review.
- c. Failure of an audited prototype prerequisites or credit will result in that item being denied in the current review. The denied item will temporarily drop out of the set of approved prototype prerequisites/credits as the project team will be required to demonstrate achievement of this specific item for the next three consecutive project application reviews. Once achievement is demonstrated, this item will return to the prototype set. If achievement is NOT demonstrated in any one of the next three consecutive project application reviews, the item shall be permanently removed from the prototype set.
- d. Appeals will not be permitted for prototype prerequisites/credits in subsequent projects.
- e. Prerequisites/credits may be dropped from the approved set of prototype prerequisites/credits at the project team's discretion. Once removed from the set, this item shall not be reviewed as a prototype prerequisite/credit unless it is re-established as such by demonstrating achievement of this specific item for three consecutive project application reviews, or per the steps outlined in #2 above.
- f. Prerequisites/credits may be added to the approved set of prototype prerequisites/credits at the project team's discretion. It must be established as such by demonstrating achievement of this specific item for three consecutive project application reviews or per the steps outlined in #2 above (for the latter, this action shall occur with an individual project application, and a fee will be associated with adding this item to the prototype set).

The process above assumes that all buildings will be constructed to a specific standard and that credits associated with that standard can receive preliminary approval. Within the campus setting, the situation can arise where certain site-related amenities would

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not be constructed until after the building project is complete. This may result in some pending credits for buildings. These pending credits cannot be awarded until the actual master plan is put into effect and the shared amenities constructed. The individual projects have two choices:

- 1. Complete certification of the project with certain credits "pending." These pending credits may alter the rating of the project. If the project is rated without the pending credits, its rating will be based on only those credits achieved. Once the pending credits are available, the project can be recertified and the credits awarded at that time.
- 2. Await certification until all credits are available.

The volume/campus build process can also be a useful tool for developers to use when managing a portfolio of buildings. Tracking site-specific issues and benefits of individual credits or strategies and the lessons learned during the process will inform future design revisions and decisions. Whether building and certifying projects one at a time, or as a package of several buildings, project teams must be fair and reasonable in defining the project scope and site boundaries and be consistent across credit calculations.

Summary of Prerequisites and Credits

14 Possible Points
Required
1
1
1
4
2
2
2
1

Water Efficiency	5 Possible Points
Credit 1: Water Efficient Landscaping	2
Credit 2: Innovative Wastewater Technologies	1
Credit 3: Water Use Reduction	2

Energy and Atmosphere	17 Possible Points
Prerequisite 1: Fundamental Building Systems Commissioning	Required
Prerequisite 2: Minimum Energy Performance	Required
Prerequisite 3: CFC Reduction in HVAC&R Equipment	Required
Credit 1: Optimize Energy Performance	10
Credit 2: Renewable Energy	3
Credit 3: Additional Commissioning	1
Credit 4: Ozone Protection	1
Credit 5: Measurement and Verification	1
Credit 6: Green Power	1

Materials and Resources	13 Possible Points
Prerequisite: Storage and Collection of Recyclables	Required
Credit 1: Building Reuse	3
Credit 2: Construction Waste Management	2
Credit 3: Resource Reuse	2
Credit 4: Recycled Content	2
Credit 5: Local/Regional Materials	2
Credit 6: Rapidly Renewable Materials	1
Credit 7: Certified Wood	1

Indoor Environmental Quality	15 Possible Points
Prerequisite 1: Minimum IAQ Performance	Required
Prerequisite 2: Environmental Tobacco Smoke (ETS) Control	Required
Credit 1: Carbon Dioxide (CO2) Monitoring	1
Credit 2: Ventilation Efficiency	1
Credit 3: Construction IAQ Management Plan	2
Credit 4: Low-Emitting Materials	4
Credit 5: Indoor Chemical and Pollutant Source Control	1
Credit 6: Controllability of Systems	2
Credit 7: Thermal Comfort	2
Credit 8: Daylighting and Views	2
Innovation and Accredited Professional Points	5 Possible Points
Credit 1: Innovations in Design	4
Credit 2: LEED Existing Building Accredited Professional	1
TOTAL POINTS AVAILABLE	69

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SUSTAINABLE SITES

SS Prerequisite 1: Erosion & Sedimentation Control

Application Guidance

When the site incorporates more than one building, consider the phasing of construction and how the control plan will be modified over time to achieve the requirements. Site disturbance may also be phased and erosion control techniques applied at appropriate times. For large sites, this may be required by law, so effective planning at this scale is highly recommended.

SS Credit 1: Site Selection

Application Guidance

The requirements of this credit are very specific to the project site; substitution of other parcels to meet these requirements is not allowed. Selection of a site for multiple buildings—especially one that is developed over a long period of time—will require effective site layout and planning to be sure all buildings will be able to meet the requirements.

If the site of a multiple-building development does not fully comply with credit requirements, then the buildings can not achieve the credit under a single group certification. However, in such a situation, an individual building is still eligible for the credit if it can be demonstrated that:

- the area disturbed by the building's construction activity complies with credit requirements and this is demonstrated within the LEED application submittal. This approach is expected to be most useful when buildings are being constructed at different times; OR
- 2. credit requirements are met for the area defined by a reasonable "LEED project site boundary" that corresponds to the buildings' development footprints or other fair subdivision method. The LEED application submittal must include thorough justification for this artificial site boundary, as it will be closely scrutinized. The LEED project boundary must remain consistent for all credits. This approach is expected to be most useful when buildings are constructed within the same or overlapping time frames.

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SS Credit 2: Development Density & Community Connectivity

Application Guidance

NC Version 2.2 provides a "community connectivity" option that is most likely preferable for most campus and non-urban settings. Version 2.1 guidance reflects interpretations that provide compliance pathways adjusted for campus settings.

For Version 2.2, Option 2 (Community Connectivity):

Single buildings on a campus and each building within multiple building projects must comply with the credit requirements as written in order to achieve the compliance path.

For Version 2.1 (and Version 2.2 Option 1):

Requirements

a) Show that the project complies with the Version 2.1 credit requirements as written and incorporating the concepts in the "supplemental application guidance" section, below.

OR

b) If the site is located in an existing urban area and the contiguous property is over 15 acres the project may use the campus boundaries in lieu of a documentation circle to calculate density.

OR

c) Show that the project complies with a regional or campus master planning effort to redevelop an area with existing infrastructure into a higher density area with an ultimate intended density that reflects desired local development conditions and meets the intent of this credit.

Submittals for (c)

To document that the project has achieved credit equivalence, provide the following information in addition to the Submittal Template:

- Documentation showing that the project is being located in a previously developed area with existing development and infrastructure. (New development in a greenfield would not be considered appropriate in this case.) Provide information about the existing development density based on either the documentation circle or the property boundaries.
- Documentation verifying that the project location is within a designated dense urban or campus growth area.

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 Documentation that the project is resulting in increased development density that meets or contributes to the goals of the urban development plan or campus master plan.

Supplementary Application Guidance

Typical programmatic requirements for a campus or installation can include common green spaces, land used for agriculture, and outdoor recreation spaces (except sport stadiums). These will all decrease average density when included in the calculations, yet they provide important functions and quality-of-life to a campus. Therefore, these types of required, programmed, low-density outdoor land uses may be considered added to the list of exceptions on page 21, step 5 of the LEED-NC v2.1 Reference Guide, along with "undeveloped public areas such as parks and water bodies."

Using the campus boundary for density calculations (if the campus is at least 15 acres) is beneficial because it does not penalize existing rural or suburban institutions for their neighbors' lower development density, nor does it benefit urban campuses for their neighbors' higher density. The stipulation of 15 acres was chosen because it generally indicates a sizable campus that is deemed to have a substantial enough impact to serve the credit's intent. Using this method also reduces some of the burden of documentation compared to original requirements. Once it is completed for one campus project it is simply updated for the next one, rather than defining a new boundary circle each time and researching additional buildings within a slightly different radius.

A new building is best located where shared physical and intellectual resources exist. Locating it next to an area with a higher density just to promote density rather than where it rationally belongs is not reasonable and it may create negative impacts for transportation and other community aspects. The credit's intent is well served by encouraging campuses to increase their on-campus density (even if existing density is not quite 60,000sf/acre). This approach might also encourage better master planning of building-to-infrastructure relationships on campus.

The LEED-NC v2.1 Reference Guide (page 20) says "Work with local jurisdictions and follow the urban development plan to meet or exceed density goals." Many university campuses and government installations are not required to follow local jurisdictions in this regard and should therefore establish their own density goals that meet the intent of this credit.

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SS Credit 3: Brownfield Redevelopment

Application Guidance

Large brownfield site redevelopments may vary in the amount of remediation required for specific buildings under consideration. As long as the entire site is considered a brownfield, credit may be given to buildings on portions of that site that are contaminant free and require no specific remediation for their development footprint.

SS Credit 4.1: Alternative Transportation - Public Transportation Access

Application Guidance

Work with the transit authority to re-engineer bus routes and stops to service the site so that each building is within the required proximity. Consider establishing transit corridors and zones within the campus to ensure availability and access for the entire campus. Either public or campus bus lines must be in place by the end of construction to receive credit on that basis. Campus bus lines must interface with public mass transit. If there is no local mass transit, the campus bus line must connect with a commercial bus or rail line.

For rail transit systems that have not yet been constructed, a letter from the transit authority (stating the intent to establish the rail station and confirming funding sources) is sufficient to qualify for the credit. Campus shuttles to the closest operational station (if local) can be an interim solution until a new, closer station is in full operation.

SS Credit 4.2: Alternative Transportation - Bicycle Storage & Changing Rooms

Application Guidance

The requirements are applicable to each building in a multiple-build project. When calculating the bicycle rack capacity for transients in a non-residential building, address the loading possible at one time and not the cumulative loading based on the total transients in a day. Locate the bicycle storage facilities within 50 feet of the frequently used entrances. Transient (e.g. students, in the case of a campus building) occupancy is required to be included when calculating bicycle storage capacity.

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Full-time staff (or staff FTE) may be used to calculate shower/changing room requirements. For this calculation, transients are to be defined as visitors to the building for less than 7 hours. Establish overlapping zones within the campus for ready access to shower and changing facilities.

If the project(s) is a mixed used development including residential buildings and other types of buildings, such as barracks complex on a military installation or a residential section of a campus, each building needs to meet the bicycle storage requirements based on its usage and occupancy.

A project is exempt from the shower facility requirement if all non-transient building occupants are housed on the same campus as that building (i.e. a military installation), or within a ½ mile of the building(s).

SS Credit 4.3: Alternative Transportation - Alternative Fuel, Low Emission and Fuel-Efficient Vehicles

Application Guidance

Requirements

Provide alternative fuel vehicles (ultra low sulfur diesel, CNG, LNG, electric, fuel cell, E85; or use average B50 biodiesel in standard diesel engine), low-emission and/or fuel efficient vehicles* for 3% of the full time employees (FTE) in the building(s) AND provide preferred parking for these vehicles, AND have access to a nearby alternative fueling station.

OR

Where the campus has a central fleet operation or motor pool, at least 50% of the vehicles available must be alternative fuel vehicles (as defined above).

Bi-fuel vehicles must utilize the alternative fuel option.

In the case of centralized parking, accommodations for alternative-fueled vehicles may be made at the central facilities, providing that those accommodations are credited cumulatively to each building's need based on the preceding criteria. The centralized parking must be within ¼ mile of the building(s) or serviced by a campus shuttle.

* Low-emission and fuel-efficient vehicles are defined as vehicles that are either classified as Zero Emission Vehicles (ZEV) by the California Air Resources Board or have achieved a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide.

Submittals

Provide a LEED Submittal Template and (back-up documentation that proves faculty/staff/students/employees/residents own vehicles via the preferred parking incentive program), a map identifying the location(s) of the alternative fueling facility, and for campus/installation fleet vehicles provide proof of ownership of, or 2 year lease agreement for, alternative fuel vehicles and calculations indicating that alternative fuel vehicles will serve 3% of

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building occupants. Provide site drawings or parking plan highlighting preferred parking or alternative fuel vehicles.

OR

Provide a LEED Submittal Template with specifications and site drawings highlighting alternative refueling stations. Provide calculations demonstrating that these facilities accommodate 3% or more of the total vehicle parking capacity. If centralized parking is used, provide documentation that the parking meets the requirements for distance or shuttle service.

Supplementary Application Guidance

The campus environment lends itself very well to centralized parking concepts which may more readily accommodate preferred parking. A centralized alternative fueling area may be a viable alternative in the case of flexible fuel vehicles. Fleet purchases and/or fuel choices (e.g. biodiesel) may be strategically combined to achieve the performance target. Consider incentive programs for faculty/staff/students.

SS Credit 4.4: Alternative Transportation - Parking Capacity

Application Guidance

Campuses are often exempt from local zoning laws regarding parking, and thus determine their own standards. Calculation and documentation for this credit may be done either on a project by project basis or a campus-wide basis.

Requirements

If applicable local zoning code indicates there are no minimum parking capacity requirements, or if the campus entity is exempt from local codes, size the parking capacity in transit-oriented developments (TOD's) according to the minimum requirements by building typology as outlined in the Portland, Oregon Title 33 Planning and Zoning -Chapter 33.266 for Parking and Loading, Table 266-1 and 266-2 (at

http://www.planning.ci.portland.or.us/zoning/ZCTest/200/266_parking.pdf) AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants,

OR

For rehabilitation projects add no new parking and reduce the capacity of existing oversized parking AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants.

Accommodations for carpools and vanpools may be made at the central parking facilities, providing that they are credited to only one building or project based on the preceding criteria. The centralized parking should be within ¼ mile of the building(s) served or be serviced by a shuttle bus.

Supplementary Application Guidance

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The campus environment lends itself very well to centralized parking concepts which may more readily accommodate preferred parking. An alternative method of establishing parking requirements have been provided. It is suggested that the method that generates the least parking be utilized. Long term master planning of campus parking facilities is recommended. A successful application of demographic analysis of parking facility users will help identify where parking will work best to serve mixed uses. An example is to locate parking garages where they can effectively be used by at least two groups or shifts per day, rather than a garage dedicated to just an 8am-5pm work force

When calculating the carpool space requirement on a campus where no parking is permitted within the specific project boundary, it is permissible to meet this credit by providing carpool spaces outside of the project boundary to serve the 5% of building occupants. These spaces must not be counted toward other LEED projects. Signage restricting carpool parking only to this project's occupants is not necessary. The "preferred" parking requirement is satisfied if a campus shuttle bus route serves satellite parking lots and structures. Calculation and documentation for this credit may also be achieved on a campus-wide basis. When using the campus-wide approach:

- If all parking spaces are permitted and designated as residential and commuter, the number of commuter permits may be used as the basis of calculations for carpool spaces.
- The credit can be achieved by proxy if local jurisdictional requirements that exceed the credit requirements and it is clearly demonstrated in the LEED submittal.
- Comprehensive transportation management programs are eligible for an innovation point.

Regardless of the compliance approach utilized, it is necessary to sufficiently promote the carpool program.

SS Credit 5.1

Version 2.1: Reduced Site Disturbance - Protect or Restore Open Space

Version 2.2: Site Development - Protect or Restore Habitat

Application Guidance

Submittals

- For greenfield sites, provide the LEED Submittal Template and attach a list of buildings indicating that each has met requirements.
- For previously developed sites where there are multiple buildings in the project scope, enter aggregate data in the Submittal Template, as appropriate.

Supplementary Application Guidance

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Consider the aspects of construction phasing and the use of future building footprints for staging areas and temporary disturbance locations. On projects that are only a portion of a larger development and artificial site boundaries are defined for the LEED project, be sure that they are reasonable, logical, chosen with all credits in mind, and that their use is consistent through all credits. For multiple buildings, consider aggregating any restored previously degraded parts of the site as larger areas of habitat are more effective.

SS Credit 5.2

Version 2.1: Reduced Site Disturbance - Development Footprint

Version 2.2: Site Development - Maximize Open Space

Application Guidance

Requirements

Open space area can be either adjacent to the building(s) or at another location on the campus. It must be aggregated and contiguous, not divided and dispersed. The open space may be at another campus site as long as it is placed in a permanent reserve status.

Submittals

- If there are multiple buildings in the project scope, enter aggregate data in the Submittal
- For campus areas where the choice is made to have the open space set-aside not adjacent to the buildings provide documentation showing the requirements have been met and the land is in a natural state or been returned to a natural state and conserved for life of the buildinas.

Supplementary Application Guidance

Open space does not have to be contiguous to the building(s) to which it is accredited. Open space may be aggregated and set aside as a larger plot of land. The land must be in a natural state or returned to a natural state; quads and playing fields do not count towards attaining this credit. This may enhance ecosystems and provide a larger piece of habitat. Clustering of buildings is good practice in terms of concentrating the impact of development in a limited area, leaving more of the site in its natural state, or providing for larger areas of habitat. Establishment of the project boundary with all credits in mind can enhance this process. Vegetated roofs may also contribute to credit compliance if the plantings meet the definition of native/adapted.

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SS Credit 6.1

Version 2.1: Stormwater Management - Rate and Quantity

Version 2.2: Stormwater Design: Quantity Control

Application Guidance

Requirements

The credit requirements may be met using a centralized approach affecting the defined project site and that is within the campus boundaries. Distributed techniques based on a watershed approach are then required.

Submittals

If there are multiple buildings in the project scope, enter aggregate data in the Submittal Template. Demonstrate that centralized stormwater management strategies using distributed technologies achieve credit performance requirements.

Supplementary Application Guidance

A master planning approach to storm water management and overall impervious surface management that is campus-wide or based on the local watershed is preferred over stormwater management planning limited to one project site at a time. The campus setting with larger boundaries and settings allows comprehensive stormwater management techniques to be applied on a larger scale and with more flexibility. This provides economies of scale and affords greater opportunities for clustering buildings, increasing natural settings, and applying distributed management techniques cost effectively. Phasing of projects may affect when a Master Plan is implemented and how the specific building(s) under consideration will be accommodated.

SS Credit 6.2 1 Point

Version 2.1: Stormwater Management – Treatment

Application Guidance

Same as credit 6.1.

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SS Credit 7.1: Heat Island Effect - Non-Roof

Application Guidance

Submittals

If there are multiple buildings in the project scope, enter aggregate data in the Submittal Template and list the buildings meeting this credit.

Supplementary Application Guidance

The campus setting with larger boundaries and settings allows comprehensive heat island management techniques to be applied on a larger scale and with more flexibility. This provides economies of scale and affords greater opportunities for clustering buildings, increasing pervious surfaces and natural settings, and applying management techniques cost effectively.

SS Credit 7.2: Heat Island Effect - Roof

Application Guidance

Submittals

If there are multiple buildings in the project scope, enter aggregate data in the Submittal Template and provide a list of buildings meeting the credit.

Supplementary Application Guidance

An average of compliance for building roof areas may be used to meet these requirements when more than one building is on the site. For each building or for the group of buildings, combinations of high albedo and vegetated roof must collectively cover 75% of the roof area.

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SS Credit 8: Light Pollution Reduction

Application Guidance

Requirements

Develop an exterior lighting master plan that includes the project site and the surrounding buildings in a comprehensive manner addressing the safety and security issues of the campus environment by sharing exterior lighting amenities while minimizing light pollution and energy consumption. The lighting master plan must show that it incorporates the credit requirements as well as the following:

- How this plan will reduce light trespass and night sky access and specific projects fit into the overall design.
- How safety, security, and comfort will be enhanced by the use of a master plan.

Submittals

- Provide exterior lighting master plan that addresses the project site and buildings and infrastructure showing how overall light pollution is reduced.
- Provide a design narrative from the Architect, Electrical Engineer, or responsible party that demonstrates what measures have been implemented for the registered LEED building(s) to meet the provisions of the exterior lighting master plan in the campus requirements.

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WATER EFFICIENCY

WE Credit 1: Water Efficient Landscaping

Application Guidance

Submittals

If there are multiple buildings in the project scope, enter aggregate data in the Submittal Template. Submit appropriate documentation supporting the design of the rainwater collection system, the landscape design, and the extent of the supplemental temporary irrigation system.

Supplementary Application Guidance

Landscaping in the larger context of the campus provides abundant opportunity to implement solutions that require less water and for capturing rainwater or recycled water. Large campuses may consider treating its buildings' wastewater to standards for non-potable uses.

While consistency in site boundaries is required, the initial flexibility in site boundary selection and building clustering options allow for enhanced opportunities for sharing captured or reusable water. The project may also use native plants and other landscape alterations leading to a lower water demand. A temporary irrigation system may be used during establishment period for landscape.

WE Credit 2: Innovative Wastewater Technologies

Application Guidance

Submittals

If there are multiple buildings in the project scope, enter weighted aggregate data in the Submittal Template.

Supplementary Application Guidance

When the site has more than one building, a weighted average of the site buildings, based on square footage, must be used to meet the requirements of the credit. This method ensures that each building generally meets the performance requirements.

Opportunities of scale may also allow more effective use of rain harvesting techniques or innovative and economical waste treatment technologies for the building(s) on the site. Options

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include packaged biological nutrient removal systems, constructed wetlands, and high-efficiency filtration systems.

WE Credit 3: Water Use Reduction

Application Guidance

Submittals

If there are multiple buildings in the project scope, enter weighted aggregate data in the Submittal Template.

Supplementary Application Guidance

When the site has more than one building, a weighted average of the site buildings, based on square footage, must be used to meet the requirements of the credit. This method ensures that each building generally meets the performance requirements.

Opportunities of scale may also allow more effective use of certain techniques in differing buildings on the site.

Because of the varying occupant numbers in some types of campus buildings (including students, staff, and visitors) an alternative method of calculating this credit may be used. Rather than basing the calculations on the number of occupants, the water use may be based on the total number of each type of applicable fixtures in the building and the estimated number of uses for each of these. For example, for public water closets a sample calculation is as follows: Total Daily Water Use (Public WC) = Total Number Of Fixtures x Estimated Daily Uses x Flow Rate(GPF) x Duration

The calculations should use the same fixture count and daily use numbers for the base and proposed case. This provides a reasonable representation of base and proposed case water use. Calculations should include all flush fixtures and the following flow fixtures: public and private lavatories, public and private showers, kitchen faucets, and laboratory and service lavatories.

The following as process loads may be excluded: eyewash fountains, emergency showers, water coolers, and water fountains.

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ENERGY & ATMOSPHERE

EA Prerequisite 1

Version 2.1: Fundamental Building Systems Commissioning

Fundamental Commissioning of the Building Energy Version 2.2: **Systems**

Application Guidance

Requirements

Each building in a project must independently meet the requirements of this prerequisite.

Supplementary Application Guidance

Every building on the project site must document compliance. An employee in the owner's organization, who is not responsible for project design or construction management or supervision of the project and who has the appropriate credentials, would be the preferred commissioning authority for EA Prerequisite 1. The documentation for EA Prerequisite 1 may be from the design firm, but the individual acting as the commissioning authority must not be responsible for project design, construction management, or supervision.

In the campus setting, other elements and site features associated with a building project, such as fountains, irrigation system, wheelchair lifts, 'help phones', and exterior lighting systems which are not actual part of a building should also be considered for the commissioning process.

Many campus organizations have commissioning requirements for all projects such as a Project Delivery Process (PDP) Manual which outlines required commissioning related steps for each project phase, from initial scoping to closeout. It is suggested that these types of documents be reviewed for compliance with the LEED fundamental commissioning requirements and be modified, if necessary, to ensure that the strategies employed by the design team to achieve the fundamental commissioning credit fulfills all requirements set forth by the LEED reference guide. A local document or manual as well as any specifications that reference the manual may be submitted along with documentation of how the local manual and procedures specifically meet or exceed the referenced LEED standard. A local manual may serve as documentation for the development of the commissioning plan as long as the manual also complies with the LEED reference guide. The intent of the fundamental commissioning prerequisite will be met assuming the applicant provides information demonstrating their standard building practices, as outlined in the locally-generated procedures manual, meet or exceed the LEED referenced commissioning requirements.

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EA Prerequisite 2: Minimum Energy Performance

Application Guidance

Requirements

Each building in a project must independently meet the requirements of this prerequisite.

Supplementary Application Guidance

When designing a group of buildings, orientation and site utilization can have a major impact on energy consumption. Consider the group of buildings as a whole for the application of passive tempering and alternative energy applications.

EA Prerequisite 3

Version 2.1: CFC Reduction in HVAC&R Equipment

Version 2.2: Fundamental Refrigeration Management

Application Guidance

Requirements

Each building in the project must meet this prerequisite. If the building(s) is connected to a central chilled water system, that system must either be CFC free or a commitment to phasing out CFC-based refrigerants must be in place, with a firm timeline of five years from completion of the project. Prior to phase out, reduce annual leakage of CFC-based refrigerants to 5% or less using EPA Clean Air Act, Title VI, Rule 608 procedures governing refrigerant management and reporting.

An alternative compliance path for buildings connected to a central chilled water system requires a third party (as defined in the LEED-EB Reference Guide) audit showing that system replacement or conversion is not economically feasible. The definition of the required economic analysis is: the replacement of a chiller(s) will be considered to be not economically feasible if the simple payback of the replacement is greater than 10 years. To determine the simple payback, divide the cost of implementing the replacement by the annual cost avoidance for energy that results from the replacement and any difference in maintenance costs including make-up refrigerants. If CFC-based refrigerants are maintained in the central system, reduce annual leakage to 5% or less using EPA Clean Air Act, Title VI, Rule 608 procedures governing refrigerant management and reporting and reduce the total leakage over the remaining life of the unit to less than 30% of its refrigerant charge.

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Submittals

Provide a LEED Submittal Template, signed by a licensed professional engineer or architect and an attached list of the buildings declaring that each building's HVAC&R systems do not use CFC-based refrigerants.

OR

Provide a modified LEED Submittal Template, signed by a licensed professional engineer or architect with an attached list of the buildings and a letter of commitment from the campus/installation declaring its intention to phase-out CFCs and a summary of the phase out plan describing actions and approximate time frame. AND demonstrate that until phase out, existing CFC containing equipment meets EPA Title VI, Rule 608, procedures for refrigerant management and reporting.

OR

Provide results of third-party audit demonstrating that replacement is not economically feasible based a 10-year simple pay-back analysis. AND provide documentation showing compliance with EPA Clean Air Act, Title VI, Rule 608 governing refrigerant management and reporting. Provide documentation showing that the annual refrigerant leakage rate is below 5%, and the leakage over the remainder of unit life is being maintained below 30%.

Supplementary Application Guidance

If connecting to a central system containing CFC refrigerants operate according to USEPA criteria and plan for phasing out the CFC refrigerants. The use of CFCs in central plants is an ongoing issue for the campus environment. Systems using CFCs are older and less efficient than newer systems using modern refrigerants. It is in the best interests of all to phase out the use of CFCs from several perspectives including ozone depletion, global warming potential, and energy efficiency. When funds are lacking to modernize central chiller plants, the use of third party financing may be a viable alternative if the energy savings from the new equipment can pay for the initial investment. Consider contracting with an energy services company that fronts the equipment, guarantees savings, and is paid out of a share of the savings.

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EA Credit 1: Optimize Energy Performance

Application Guidance

Requirements

This credit applies to each building within the project scope. To receive a single rating for a group of buildings, use a weighted average for the group of buildings based on their conditioned square footage, or aggregate the data into one PRM calculation, so that performance is achieved by buildings of varying sizes within a certifying group. Each building must still meet EA Prerequisite 1 and may receive its own rating if that is desired.

Supplementary Application Guidance

Consider energy sources such as waste heat or recovered resources. Reduced energy cost may reflect the effect of time-dependent valuation of energy (time-of-use) rates or demand charges when working in conjunction with permanently installed efficiency or storage systems. Environmental impacts result from the operation and expansion of energy infrastructure both on and off site. Application of the more efficient combined heat and power systems and energy storage systems may be applied more effectively in the campus environment. Since the buildings are rated based upon the energy (and its cost) that crosses the building boundary, more efficient central energy systems and thermal storage should be used as the basis of energy cost reductions in the calculation of the building's energy performance. Calculation instructions for Version 2.1 and 2.2 will be supplied as supplements to the respective Reference Guides.

EA Credit 2: On-Site Renewable Energy

Application Guidance

Requirements

A group of buildings may be evaluated on a group average, based on square footage, or each building may receive its own rating.

Submittals

For multiple buildings either use aggregate data in the Submittal Template and provide a list of the buildings or provide a Submittal Template for each building.

Supplementary Application Guidance

Consider orientation of the buildings as a group for maximum access to renewable energy. A central renewable energy system may be more cost effective than individual systems on the separate buildings. In the case where the renewable energy equipment is not physically located Section: APPENDIX N W9126G-10-R-0103-0002 Page 285 of 572

on the applicant building(s), provide data for each building showing the projected energy consumption and the percentage to be met with their prorated or dedicated share of renewable energy. The owner should also submit a certification letter acknowledging that the renewable energy from a central system will apply only to the submitted project(s) and will not be applied to subsequent buildings for any future LEED certifications.

Another campus consideration may be the energy used to light pathways and other connective routes between multiple buildings in a group. For Version 2.1, the energy benefit of solarpowered pole lights can be applied to EA Credit 2 (Renewable Energy) on a special calculation basis. Normally, site lighting is not included in the ASHRAE 90.1 energy model unless attached to the building. After the energy modeling is completed, add the unregulated site lighting's electricity requirements to the design case's Regulated Subtotal (DEC) and add the solarpowered pole lights' contribution to it. This special calculation method awards the use of the technology within the appropriate context. The pole lighting contribution is not to be factored into EA Credit 1 calculations. Version 2.2 Option 1 accounts for site lighting within the updated referenced standard.

EA Credit 3 1 Point

Additional (Enhanced) Commissioning

Application Guidance

Requirements

Each building in a project must independently meet the requirements of this credit.

Supplementary Application Guidance

The Reference Guide elaborates that the intent of the credit is that "The Additional Commissioning Credit ensures peer review through independent, third party verification." An employee in the owner's organization, who is not responsible for the management or design of the project and who has the appropriate credentials, may serve as the "independent" commissioning authority. For example, if a university has architects who design the campus buildings, an engineer from the facility management staff can be considered the independent commissioning authority.

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EA Credit 4

Version 2.1: Ozone Protection

Version 2.2: Enhanced Refrigerant Management

Application Guidance

Requirements

Each building in a multiple building project must meet the requirements of this credit in order to achieve it. In a campus setting, even if the project is only a single building, this often involves a central plant.

Version 2.1: If the building(s) is (are) connected to a central chilled water system, that system must be HCFC free or a commitment must be in place to phasing out HCFC-based refrigerants within 5 years from completion of the project.

Version 2.2: If the building(s) is (are) connected to a central chilled water system, that system must meet the credit requirements.

Supplementary Application Guidance

This credit is problematical to some campus situations where the central system is not owned by the campus operator. Negotiations with the chilled water supplier may be effective in getting their commitment to comply with v2.1 or v2.2 requirements. For Version 2.2, have the chilled water supplier perform the required calculations and submit a letter showing compliance.

In the selection of refrigerants, consider their global warming potential as part of the analysis criteria. A life-cycle analysis that includes the future impact of the Montreal Protocol should guide choice of refrigerants.

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EA Credit 5: Measurement and Verification

Application Guidance

Requirements

Each building in a project must independently meet the requirements of this credit.

Submittals

If there are multiple buildings, attach a list of the buildings meeting the credit criteria. Separate M&V plans may be required for buildings that significantly differ.

Supplementary Application Guidance

Consider adding the functions that meet the requirements of this credit to a central energy management and control system for the campus. This would allow a continuous commissioning process for the building and maintenance issues could be centrally alarmed and personnel dispatched to keep systems in peak operating mode.

EA Credit 6: Green Power

Application Guidance

Requirements

Green power may be purchased on a centralized basis and credit attributed to a specific project. This same green power may not be credited to another project.

Submittals

Provide certification that any purchased green power is solely applied as credit to this project. If more than one building is to receive credit, provide data for each building showing the projected energy consumption of the buildings and the percentage to be met with green power. If the green power is generated by a campus entity, show that it meets Green-e standards.

Supplementary Application Guidance

Volume discounts are available from some Green Tag brokers. Therefore, it may be financially advantageous to the campus owner if multiple buildings are achieving this credit. Cogeneration from renewable sources (that meet Green-e standards) would be credited in EA Credit 2. Consider ID Credits for exemplary performance when 100% of green power content is used for extended periods.

MATERIALS & RESOURCES

MR Prerequisite 1: Storage & Collection of Recyclables

Application Guidance

Requirement

A central sorting and collection facility serving multiple buildings will also meet the intent of this credit as long as provisions are made for the collection of the recyclable materials within each building.

Submittals

If a central facility is used for sorting and/or temporary storage, include a narrative that succinctly describes collection procedures, frequency (based on generation estimates) and facilities.

MR Credit 1.1 to 1.3: Building Reuse

Application Guidance

Submittal

If there are multiple buildings in the project scope, enter aggregate data in the primary Submittal Template. Also provide one hardcopy version of the Submittal Template for each building's data.

MR Credit 2: Construction Waste Management

Application Guidance

Submittals

If there are multiple buildings in the project scope, enter aggregate data in the Submittal Template.

Supplementary Campus Application Guidance

Additional strategies for campuses include documenting salvage that occurs by owner organizations prior to the building being turned over to contractors for demolition including

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offering materials to academic programs on campus such as fine arts or architectural studios or for troop construction projects on military installations.

MR Credits 3 through 7

Application Guidance

Submittals

If there are multiple buildings in the project scope, enter aggregate data in the Submittal Template.

INDOOR ENVIRONMENTAL QUALITY

EQ Prerequisite 1: Minimum IAQ Performance

Application Guidance

Requirements

If there are multiple buildings on the project site, each building must independently meet the requirements.

EQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control

Application Guidance

Requirements

If there are multiple buildings on the project site, each building must independently meet the requirements.

Version 2.1 projects can use any Version 2.2 compliance path (v2.2 requirements are simply a compilation of v2.1 credit rulings).

Submittals

List all buildings and identify which method was used on each.

EQ Credit 1: Carbon Dioxide (CO₂) Monitoring

Application Guidance

Requirements

If there are multiple buildings on the project site, each building must independently meet the requirements.

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EQ Credit 2: Ventilation Effectiveness

Application Guidance

Requirements

If there are multiple buildings on the project site, each building must independently meet the requirements.

EQ Credit 3.1 and 3.2: Construction IAQ Management Plan

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

Version 2.1 projects can use any Version 2.2 compliance path (v2.2 requirements are simply a compilation of v2.1 credit rulings).

EQ Credit 4.1: Low-Emitting Materials - Adhesives & Sealants

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

Supplementary Application Guidance

Version 2.2 requirements are more stringent than Version 2.1.

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EQ Credit 4.2: Low-Emitting Materials - Paints and Coatings

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

Supplementary Application Guidance

Version 2.2 requirements are more comprehensive (and thus more stringent) than Version 2.1.

EQ Credit 4.3: Low-Emitting Materials - Carpet

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

EQ Credit 4.4: Low-Emitting Materials - Composite Wood

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

Supplementary Application Guidance

Version 2.2 requirements are more comprehensive (and thus more stringent) than Version 2.1.

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EQ Credit 5: Indoor Chemical & Pollutant Source Control

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

EQ Credit 6.1: Controllability of Systems- Perimeter Spaces

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

Supplementary Campus Application Guidance

Examine trade-offs of natural ventilation using operable windows in spaces that will need to be darkened for projection equipment. Some types of power operated black-out shades can be pulled from their tracks by breezes through large window openings. If natural ventilation is a priority and power shades are also required, employ strategies that do not utilize the glazing area of the exterior walls.

EQ Credit 6.2: Controllability of Systems, Non-Perimeter Spaces

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

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EQ Credit 7.1: Thermal Comfort- Compliance with ASHRAE 55-1992

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

Supplementary Campus Application Guidance

Version 2.1 projects can use the Version 2.2 compliance path (v2.2 requirements are simply a compilation of v2.1 credit rulings).

EQ Credit 7.2: Thermal Comfort- Permanent Monitoring System

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

EQ Credit 8.1 and 8.2: Daylight and Views

Application Guidance

Requirements

If there are multiple buildings on the project site, then each building must independently meet the requirements.

INNOVATION & DESIGN PROCESS

ID Credit 1.1 – 1.4: Innovation in Design

Application Guidance

In the campus setting and with multiple buildings, additional innovative opportunities arise, specifically with infrastructure and site issues. Economies of scale allow for more creativity and application of initiatives with larger scopes. The strategies and documentation for achieving innovation credits related to the site may be "duplicated" in multiple buildings or multiple applications for separate buildings, provided a clear description of how the whole site achieves the intended credits is presented. It must be clear that none of the required areas or facilities is counted twice. Each credit should be carefully assessed and treated fairly, respective of overall site issues (e.g., pervious surfaces) versus individual building issues (e.g., roofing). For example, if the project is applying for SSc5.2, which requires that permanent open space be designated adjacent to the building, the area of this open space must reflect the combined footprints of all of the buildings.

An innovation credit is warranted if activities and/or programs inspired by a LEED project are applied to the campus as a whole, thus delivering correspondingly larger environmental benefit.

ID Credit 2: LEED Accredited Professional

No application guidance is necessary.

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LEED Credit Paragraph		รร	CTR Substitution Permitted	Required Points Strategy	
edit	LEED Multiple	Building CTR	Su	l Pc	
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ED		ildir	о е	duj	
	Responsibilities Table	Bu	Site	Re	NIC=Not in Contract N/A=Not Applicable R=Required
BUILD	ING: Warriors In Transition (WT)	FAC	ILI.	TIES
PAR	FEATURE	_			REMARKS
	RY 1 – SUSTAINABLE SITES				
JAILOO	Construction Activity Pollution				Site CTR is primary permittee. Building CTR is secondary permittee to
SSPR1	Prevention (PREREQUISITE)	NIC	NO	R	primary permittee.
SS1	Site Selection	NIC	NO		Site CTR responsible.
	Development Density & Community				
SS2	Connectivity	NIC	NO		Site CTR responsible.
SS3	Brownfield Redevelopment	NIC	NO		Site CTR responsible.
	Alternative Transportation: Public				
SS4.1	Transportation Access	NIC	NO		Site CTR responsible.
	Alternative Transportation: Bicycle				Combined Bldg/Site credit. Site CTR responsible for bicycle storage.
SS4.2	Storage & Changing Rooms Alternative Transportation: Low	NO	NO	1	Building CTR responsible for shower/changing rooms.
	Emitting & Fuel Efficient Vehicles -				
SS4.3	OPTION 1	NIC	YES		Site CTR responsible.
	Alternative Transportation: Low				
SS4.3	Emitting & Fuel Efficient Vehicles - OPTION 2	NIC	YES	1	Site CTR responsible.
334.3	Alternative Transportation: Low	INIC	ILS		Site CTR Tesponsible.
	Emitting & Fuel Efficient Vehicles -				
SS4.3	OPTION 3	NO	NO		Combined Bldg/Site credit.
004.4	Alternative Transportation: Parking	NIC	VEC		Cita CTD vacanaikla
SS4.4	Capacity Site Development: Protect or Restore	INIC	YES		Site CTR responsible.
SS5.1	Habitat	NIC	YES		Site CTR responsible.
	Site Development: Maximize Open		\/E-5		
SS5.2 SS6.1	Space Stormwater Design: Quantity Control	NIC	YES YES	1	Site CTR responsible. Site CTR responsible.
SS6.2	Stormwater Design: Quality Control		YES		Site CTR responsible.
	,, ,				Building CTR responsible for 100% reflective pavement (concrete meets
007.4			\/= <u>-</u>		requirement). Site CTR responsible for meeting requirement for all
SS7.1 SS7.2	Heat Island Effect: Non-Roof Heat Island Effect: Roof		YES NIC	1	hardstand within Site CTR project scope. Building CTR responsible.
301.2	Figurialia Effect. Nooi	0	1110	,	Sanding OTT Tooponoisio.
					Combined Bldg/Site credit. Building CTR responsible for building lighting
SS8	Light Pollution Reduction	NO	NO	1	rqmts. Site CTR responsible for site lighting rqmts.
	RY 2 – WATER EFFICIENCY	NO	NIC	D	Ruilding CTP responsible
WEPR1 WE1.1	Water Use Reduction (v3 only) Water Efficient Landscaping: Reduce		NIC YES		Building CTR responsible. Site CTR responsible.
	Tractic Emission Earlandaping. Reduce		0		S. C. C. C. Sportolorio
	Water Efficient Landscaping: No				
WE1.2	Potable Water Use or No Irrigation	NIC	YES	1	Site CTR responsible.

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LEED Credit Paragraph	LEED Multiple Contractor Responsibilities Table	Building CTR Substitution Permitted	Site CTR Substitution Permitted	Required Points Strategy	NIC=Not in Contract N/A=Not Applicable R=Required
BUILD	ING: Warriors In Transition (WT)	FAC	CILI.	TIES
PAR	FEATURE				REMARKS
WE2	Innovative Wastewater Technologies - OPTION 1	YES	YES		Proposed credit must fall within CTR scope or be coordinated with other CTR.
	Innovative Wastewater Technologies -				
WE2 WE3	OPTION 2 Water Use Reduction		YES NIC	2	Site CTR responsible. Building CTR responsible.
VVE3	vvaler Use Reduction	TES	INIC		Building OTK responsible.
CATEGO	DRY 3 – ENERGY AND ATMOSPHERE	<u> </u>			<u>'</u>
	Fundamental Commissioning of the				
E 4 D D 4	Building Energy Systems			_	Building CTR responsible for commissioning of building systems. Site CTR
EAPR1	(PREREQUISITE) Minimum Energy Performance	NO	NO	R	responsible for commissioning of site systems.
EAPR2	(PREREQUISITE)	NO	NIC	R	Building CTR responsible.
	Fundamental Refrigerant Management			- ` `	Zamanig O 11 1 Toop on to 10 T
EAPR3	(PREREQUISITE)	NO	NIC	R	Building CTR responsible.
EA1	Optimize Energy Performance	YES	NIC	6	Building CTR responsible.
EA2	On-Site Renewable Energy	YES	NO		Proposed credit must fall within CTR scope or be coordinated with other CTR.
E 4 0	Full and and Output in a little in a	NO	NO		Building CTR responsible for commissioning of building systems. Site CTR
EA3 EA4	Enhanced Commissioning Enhanced Refrigerant Management	NO YES	NO NIC	1	responsible for commissioning of site systems. Building CTR responsible.
EA5	Measurement & Verification		NIC		Building CTR responsible.
EA6	Green Power	NO	NIC		Building CTR responsible.
	DRY 4 – MATERIALS AND RESOURCES				-
DAILGO	Storage & Collection of Recyclables	Ī			
MRPR1	(PREREQUISITE)	NO	NIC	R	Building CTR responsible.
MR1	Building Reuse	N/A	N/A		Pullding CTP responsible for diversion of minimum 500/ of weeks
MR2.1	Construction Waste Management: Divert 50% From Disposal	NO	NO	1	Building CTR responsible for diversion of minimum 50% of waste generated. Site CTR responsible for diversion of minimum 50% of waste generated. Building CTR responsible for diversion of minimum 75% of waste
MR2.2	Construction Waste Management: Divert 75% From Disposal	NO	NO		generated. Site CTR responsible for diversion of minimum 75% of waste generated.
MR3.1	Materials Reuse: 5%	NO	NO		Building CTR responsible for 5% materials reuse. Site CTR responsible for 5% materials reuse.
MR3.2	Materials Reuse: 10%	NO	NO		Building CTR responsible for 10% materials reuse. Site CTR responsible for 10% materials reuse.
WII (O.Z	Recycled Content: 10% (post-	.,,	.,,		Building CTR responsible for minimum 10% recycled materials. Site CTR
MR4.1	consumer + 1/2 pre-consumer)	NO	NO	1	responsible for minimum 10% recycled materials.
					Tuesday, October 26, 2010

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LEED Credit Paragraph	LEED Multiple Contractor Responsibilities Table	Building CTR Substitution Permitted	Site CTR Substitution Permitted	Required Points Strategy	NIC=Not in Contract N/A=Not Applicable R=Required
	ING: Warriors In Transition (TIES
PAR	FEATURE				REMARKS
	Recycled Content: 20% (post-				Building CTR responsible for minimum 20% recycled materials. Site CTR
MR4.2	consumer + 1/2 pre-consumer)	NO	NO		responsible for minimum 20% recycled materials.
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally	NO	NO	1	Building CTR responsible for minimum 10% regional materials. Site CTR responsible for minimum 10% regional materials.
	Regional Materials:20% Extracted,				Building CTR responsible for minimum 20% regional materials. Site CTR
MR5.2	Processed & Manufactured Regionally	NO	NO		responsible for minimum 20% regional materials.
MR6	Rapidly Renewable Materials	YES	NIC		Building CTR responsible.
MR7	Certified Wood RY 5 – INDOOR ENVIRONMENTAL QU	NO JALIT	NO Y		Building CTR responsible for minimum 50% certified wood. Site CTR responsible for minimum 50% certified wood.
	Minimum IAQ Performance				
EQPR1	(PREREQUISITE)	NO	NIC		Building CTR responsible.
FORRO	Environmental Tobacco Smoke (ETS)	NO	NO		Building CTR responsible for building ETS control features. Site CTR
EQPR2	Control (PREREQUISITE)	NO YES	NO		responsible for site ETS features. Building CTR responsible.
EQ1 EQ2	Outdoor Air Delivery Monitoring Increased Ventilation		NIC		Building CTR responsible.
_ ~~	Construction IAQ Management Plan:		0		
EQ3.1	During Construction	YES	NIC	1	Building CTR responsible.
	Construction IAQ Management Plan:				
EQ3.2	Before Occupancy	YES	NIC	1	Building CTR responsible.
F044	Low Emitting Materials: Adhesives &	V= 2		_	Delities OTD sees and it is
EQ4.1	Sealants Low Emitting Materials: Paints &	YES	NIC	1	Building CTR responsible.
EQ4.2	Coatings	YES	NIC	1	Building CTR responsible.
	Low Emitting Materials: Carpet/Flooring		0	·	
EQ4.3	Systems	YES	NIC	1	Building CTR responsible.
F0 : :	Low Emitting Materials: Composite	\/= <u>-</u>			
EQ4.4	Wood & Agrifiber Products	YES	NIC	1	Building CTR responsible.
EQ5	Indoor Chemical & Pollutant Source Control	YES	NIC	1	Building CTR responsible.
EQ6.1	Controllability of Systems: Lighting	YES			Building CTR responsible.
	Controllability of Systems: Thermal		0		
EQ6.2	Comfort	YES	NIC		Building CTR responsible.
EQ7.1	Thermal Comfort: Design	YES	NIC	1	Building CTR responsible.
EQ7.2	Thermal Comfort: Verification Daylight & Views: Daylight 75% of	YES	NIC		Building CTR responsible.
EQ8.1	Spaces	YES	NIC		Building CTR responsible.
٥.١	Daylight & Views: Views for 90% of	1 L O	1410		Danding OTA responsible.
EQ8.2	Spaces	YES	NIC		Building CTR responsible.
	RY 6 – INNOVATION IN DESIGN				
IDc1.1	Innovation in Design	YES	YES		Proposed credit must fall within CTR scope or be coordinated with other CTR.
					Tuesday, October 26, 2010

Section: APPENDIX O W9126G-10-R-0103-0002 Page 299 of 572 **Building CTR Substitution Permitted** Site CTR Substitution Permitted Required Points Strategy EED Credit Paragraph **LEED Multiple** Contractor **Responsibilities Table** NIC=Not in Contract N/A=Not Applicable R=Required **BUILDING: Warriors In Transition (WT) FACILITIES** PAR **FEATURE REMARKS** Proposed credit must fall within CTR scope or be coordinated with other IDc1.2 YES YES Innovation in Design Proposed credit must fall within CTR scope or be coordinated with other IDc1.3 Innovation in Design YES YES Proposed credit must fall within CTR scope or be coordinated with other CTR. IDc1.4 Innovation in Design YES YES LEED Accredited Professional NO NO IDc2 CATEGORY 7 - REGIONAL PRIORITY CREDITS (v3 only)

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TOTAL

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APPENDIX P

REV 1.0 - 30 NOVEMBER 2008

USGBC Registration of Army Projects

Typical Registration Procedure

- 1. Complete the online registration form (see guidance below) at the USGBC website http://www.usgbc.org/showfile.aspx?documentid=875 and submit it online.
- 2. Pay the registration fee via credit card (USACE staff: credit card PR&C is funded by project design or S&A funds).
- 3. The USGBC will follow up with a final invoice, the LEED-online passwords and template information.
- 4. If you have any questions, the USGBC contact (as of October 08) is:

Courtney Yan, LEED Program Assistant

U.S. Green Building Council

202/587-7180

cyan@usgbc.org

Completing the Registration Form

BEFORE YOU BEGIN:

Create a personal account with USGBC if you do not have one.
You will need the following information:
Project name as it appears in P2 (obtain from USACE Project Manager)
Building number/physical address of project
Zip code for Installation/project location
Total gross area all buildings in project
Total construction cost for buildings only (see Project Details Section instructions below)

ACCOUNT/LOGIN INFORMATION SECTION

1. The person registering the project **must have an account with USGBC** (login and password) to complete the form. If you have an account, select "I already have a USGBC Web site account" and enter email and password (twice). If you do not have an account, you may select "Create a new USGBC website account" and follow the instructions. It is recommended that you create an account separately on the USGBC website before you start the form. IMPORTANT: USACE team members are members of USGBC and are eligible for Member prices. USACE team members registering projects should be sure to include the USACE Corporate Access ID on the form (if you do not have it contact richard.l.schneider@usace.army.mil or judith.f.milton@usace.army.mil for the number).

2. The Account/Login Information section is filled out by the person registering the project. It may be a Contractor or a USACE staff member.

PROJECT TYPE SECTION

Self-explanatory. As of October 08 USACE projects use LEED for New Construction V2.2. USACE staff members are USGBC members.

GENERAL PROJECT INFORMATION SECTION

Project Title: Match the project name used in P2. Contact the USACE Project Manager for this information. **Is Project Confidential:** Indicate NO except if project has security sensitivity (elements that are FOUO or higher security) indicate YES.

Project Address 1 and 2: This is the physical location of the project. Provide building number, street address, block number or whatever is known to best describe the location of the project on the Installation.

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Project City: Installation Name

State, Country, Zip Code: Self-explanatory

How Did You Hear About LEED: USACE requirement

PRIMARY CONTACT INFORMATION

The Primary Contact may be a Contractor or a USACE staff member. USGBC considers this individual the primary point of contact for all aspects of the project. It is recommended this person be the Contractor Project Manager or the USACE Project Manager.

PROJECT OWNER INFORMATION

Project Owner First Name, Last Name, email: The Project Owner is the USACE Project Manager. **Organization Name:** U.S. Army Corps of Engineers. This field MUST be completed this way because it will be used as a search field by higher HQ to find all USACE registered projects.

PROJECT DETAILS

Owner Type: Military Base

Project Scope: Provide brief description (example: barracks complex)

Site Conditions: Provide brief description (example: wooded with steep grades) **Occupant Type:** Provide brief description (example: military and civilian employees)

Owner Occupied: No

Gross Square Footage: Provide total area all buildings in project

Project Budget: Do not include the cost for design, site work, demolition, abatement or other work – do not include Government contingency or supervision costs. For design-build and construction projects registered after award, use the awarded contract cost for construction of buildings only. For projects registered prior to award of design-build or construction contract, use the total Primary Facility cost from DD1391 or updated Primary Facility cost based on design development if available.

Current Project Phase: Identify phase at time of registration (example: design start, construction start)

Project Type: Self-explanatory

PAYMENT INFORMATION

Self-explanatory

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APPENDIX Q REV 1.1 – 31 MAY 2009 AREA COMPUTATIONS

Computation of Areas: Compute the "gross area" and "net area" of facilities (excluding family housing) in accordance with the following subparagraphs:

- (1) Enclosed Spaces: The "gross area" is the sum of all floor spaces with an average clear height $\geq 6'-11$ " (as measured to the underside of the structural system) and having perimeter walls which are $\geq 4'-11$ ". The area is calculated by measuring to the exterior dimensions of surfaces and walls.
- **(2) Half-Scope Spaces:** Areas of the following spaces shall count as one-half scope when calculating "gross area":
 - Balconies
 - Porches
 - Covered exterior loading platforms or facilities
 - Covered but not enclosed passageways and walks
 - Open stairways (both covered and uncovered)
 - Covered ramps
 - Interior corridors (Unaccompanied Enlisted Personnel Housing Only)
- (3) Excluded Spaces: The following spaces shall be excluded from the "gross area" calculation:
 - Crawl spaces
 - Uncovered exterior loading platforms or facilities
 - Exterior insulation applied to existing buildings
 - Open courtyards
 - Open paved terraces
 - Uncovered ramps
 - Uncovered stoops
 - Utility tunnels and raceways
 - Roof overhangs and soffits measuring less than 3'-0" from the exterior face of the building to the fascia
- (4) Net Floor Area: Where required, "net area" is calculated by measuring the inside clear dimensions from the finish surfaces of walls. If required, overall "assignable net area" is determined by subtracting the following spaces from the "gross area":
 - Basements not suited as office, special mechanical, or storage space
 - Elevator shafts and machinery space
 - Exterior walls
 - Interior partitions
 - Mechanical equipment and water supply equipment space
 - Permanent corridors and hallways
 - Stairs and stair towers
 - Janitor closets
 - Electrical equipment space
 - Electronic/communications equipment space

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Emergency Lighting Inverter

Fort Lewis Public Works requires emergency lighting inverters in all new buildings.

Emergency Lighting Inverter – Reference Section 01 10 00, paragraph 5.7.5.1

Replace requirement for emergency light ballasts and replace with the following:

Provide emergency lighting inverter

- a.) Emergency power exit and means of egress lighting shall be provided from a single source such as lighting inverters or generator that meets the requirements of NFPA 101. Battery systems shall incorporate maintenance-free, lead-acid or lead-calcium batteries. Battery operated emergency lighting equipment shall be self-testing/self-diagnostic that automatically performs a minimum 30 second test and diagnostic routine at least every 30 days and indicates failures and alarms. Status, test and alarm information shall be stored in memory and retrievable from unit display.
- b.) Provide provisions for remote alarm indications and condition monitoring
- c.) Emergency power source shall be located in dedicated electrical equipment room.

Section: Appendix BB

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Additional Site Requirements

Note:

All references in this Appendix shall substitute and/or replace applicable sections of 01 10 00.

6.3.1.1: Site Planning, Design, and Construction Objectives: Under separate contract, a "Warriors in Transition" (WT) Complex has been developed for Joint Base Lewis-McChord. The WT Barracks facilities and site related supporting features for the barracks as well as site related supporting features, such as parking and various hardscape, for a combined Company Headquarters/Battalion Headquarters (CO/BnHQ) and Soldier and Family Assistance Center (SFAC) facility are currently under construction. Reference the Appendix "J" for the limits of construction.

Under this contract, a combined Company Headquarters/Battalion Headquarters (CO/BnHQ) and Soldier and Family Assistance Center (SFAC) shall be constructed as part of the Warriors in Transition (WT) Complex. The combined CO/BnHQ and SFAC facility contractor is responsible for site planning, design, and construction of all functional and technical requirements listed in this project, including erosion control measures, underground conduit, piping, utility service lines and connections (electrical, communications, cable, water, sewer, stormwater, gas, mechanical), etc., within the limits of construction shown on the drawings included in Appendix "J". The project site shall be designed and constructed in accordance with UFC 3-210-05FA "Landscape Design and Planning Criteria", UFC 3-210-06A "Site Planning and Design" and UFC 3-230-06A "Drainage in Areas other than an Airfield" and one or more of the applicable criteria in Paragraph 4.0. The combined CO/BnHQ and SFAC facility contractor shall coordinate site design and site design features with the WT Barracks overall site design.

- 6.3.1.2: Sidewalks: The combined CO/BnHQ and SFAC facility contractor shall connect new walkways, within the limits of construction, to walkways which are currently being constructed under separate contract. Walkways constructed under this contract shall match the width of walkways being provided by the WT Barracks contractor under separate contract.
- 6.3.1.2.1 Ramps: Barrier free design shall be implemented throughout this project. Therefore, curb cuts shall be provided where walks intersect streets. Ramps and all facilities shall be designed to meet current Architectural Barriers Act (ABA) and the American with Disabilities Act Accessibility Guidelines (ADAAG).
- 6.3.1.3 Approved Site Development Plan: As part of a separate contract, the WT Complex Barracks contractor has designed the WT Complex site and provided the location of the combined CO/BnHQ and SFAC facility. The approved Site Development plan shows all facility locations and parking in the WT Complex is included in Appendix "J".

- 6.3.2.1. Site Furniture and Equipment: Required site furniture and equipment for the combined CO/BnHQ and SFAC shall be coordinated with the site furniture and equipment planned for the WT Complex Barracks and approved by the installation.
 - a) Exterior seating at Battalion Headquarters is preferred. Do not fabricate seating and tables of wood.
 - b) Furnishings shall be selected to enhance the sustainability of the WT Complex.
 - c) Shall establish a coordinated system that promotes consistency and continuity with JBLM standards.
 - d) Design and location shall express an image, character, and scale appropriate with JBLM standards.
 - e) Design and locate furnishings to meet Antiterrorism and Force Protection (AT/FP) standards)
 - f) Use recycled/salvage materials wherever possible.
 - g) Bicycle racks at all regularly occupied facilities with rack capacities consistent with LEED credit requirements. Provide racks fabricated of corrosion resistant materials. Place all bike racks outside of the unobstructed space per UFC 4-010-1. Racks shall be mounted on concrete pads and anchored into the pad.
 - h) Fencing as indicated for security or safety barriers. Fencing shall be galvanized, vinyl coated, or aluminum-coated, chain-link.
 - i) Physical barriers, including concrete filled steel pipe bollards and vehicle gates, as required by antiterrorism or traffic control design.
 - j) Fabricate waste receptacles of durable, corrosion-resistant materials.
 - k) Flagpoles are required at BNHQ facilities. Provide free-standing poles, 25-feet in height above surrounding ground plane. Flagpoles shall resist a 3-second duration wind gust of 85 mph. Provide brushed natural aluminum, tapered from top to bottom, with 6-inch-diameter aluminum top ball.

- 6.3.2.2 Covered Walkways: Covered walkways shall be provided as part of this contract. The contractor shall provide covered walkways as indicated on the Site Layout Utility plan located in Appendix "J". To maintain continuity within the WT Complex, the covered walkways shall match the design, lighting, materials, and finishes of the covered walkways provided by the WT Barracks contractor as included in Appendix "F". The covered walkways shall connect the main entrance of the SFAC side of the combined SFAC and CO/BnHQ Facility to the WT Barracks and from the main entrance of the CO/BnHQ side of the combined SFAC and CO/BnHQ Facility to the WT Barracks.
- 6.3.2.3 Site Elements: Site Elements shall be provided by the WT Complex Barracks contractor under a separate contract. The site elements listed below are included for information only.
 - a) Walls: Walls shall be used to screen views and deny access. Low walls may be used to define pedestrian court areas and provide informal seating.
 Screening walls can be used where appropriate for screening of building services.
 - b) Screen Walls: Walls used to screen service areas or trash enclosures shall incorporate landscape plantings to help reduce the negative visual impact of these areas. The walls shall conform to the look and feel of the architectural style for the proposed facilities.
- 6.3.3.3 Vehicular Circulation: The WT Complex Barracks contractor will provide the parking lots and vehicular circulation for the Barracks and the combined CO/BnHQ and SFAC facility under separate contract. The following information regarding Vehicular Circulation is provided for information only.
 - a) Service Drives: The WT Complex Barracks contractor shall provide service drives to each building. Locate the drives in accordance with UFC 4-010-01. Restrict access to the drives, where applicable, as required by UFC 4-010-01. Design the pavements as required by paragraph 5.2.3, "VEHICLE PAVEMENTS". The minimum access drive width shall be 10 feet. The WT Complex Barracks contractor shall design and construct drives with curbs and gutters when necessary for drainage purposes. Service drives shall match the width of service drive being provided under separate contract.
 - b) Fire Access Lanes: The WT Complex Barracks contractor shall provide fire access lanes to each building. Access must be within 33 feet of the building's entrance. Design the fire access lanes in accordance with NFPA 1, UFC 3-600-01, and the installation's requirements. Fire access lanes shall match the width of lanes being provided under separate contract.
 - c) Drop off Lane: The WT Complex Barracks contractor shall provide drop off lanes at the SFAC. The drop off lanes shall be ADA accessible.
- 6.4.1.1 A combined Site Layout and existing site utility plan is provided in Appendix "J" of this RFP and is for reference only. Information shown is approximate. Offerors shall be responsible to obtain survey data for the combined CO/BnHQ and SFAC facility site within the limits of construction. The combined CO/BnHQ and SFAC facility contractor shall field verify surface and utility elevations for their facility. NAVD 88 datum shall be used for the vertical datum.

- 6.4.1.2 Site Grading: Under separate contract, the WT Complex Barracks contractor has provided site grading, including the area for the proposed combined CO/BnHQ and SFAC facility, to facilitate drainage and provided functional building, parking, and laydown areas. Site grading included clearing and grubbing for access drives, parking lots, and any site development. Under this contract, the combined CO/BnHQ and SFAC facility contractor shall be responsible for all foundation, subbase, and building floor slabs, including final grading material and compaction for the combined CO/BnHQ and SFAC facility and site within limits of construction.
- 6.4.3.3 The installation has recently experienced loss of water pressure and adequate supplies are suspect in many locations. Sufficient water supply may not be available for this project. See hydrant flow test information provided in Appendix "D", which may not be indicative of the actual flow as the test was performed prior to the WT Barracks construction. Repairs to all reservoirs are ongoing, and anticipated for the next two years that require the post to empty the tanks. No more than two are authorized to be emptied at a time. Upgrades to the existing water distribution system outside the limits of this project except as indicated in Paragraph 6 or shown on drawings included in Appendix "J" may be required for this project, where applicable.
- 6.4.6.1 General Utilities: Provide tracer wire directly above non-metallic lines and install marking tape. Care shall be exercised by the WT Complex Barracks contractor and the combined CO/BnHQ and SFAC facility contractor when excavating trenches in the vicinity of trees. Where roots are 4-inches in diameter or greater, the trench shall be excavated by hand and tunneled. When large roots are exposed, they shall be wrapped with moist heavy burlap for protection and to prevent drying. Trenches dug by machines adjacent to trees having roots less than 4-inch diameter shall have the sides hand trimmed making a clean cut of the roots. Trenches having exposed tree roots shall be backfilled within 24 hours unless adequately projected by moist burlap or canvas. Care shall be exercised by the WT Complex Barracks contractor and the combined CO/BnHQ and SFAC facility contractor to avoid compacting and polluting the soil in the root zone of trees to remain. Both the WT Complex Barracks contractor and the combined CO/BnHQ facility contractor shall also exercise care to minimize damage to tree trunks and branches by installing a temporary fence around each tree at its drip line.

6.4.6.1

(g) Exterior Utility Installation: Where new utilities cross roads, driveways, and parking lots to be paved under this contract, install utilities prior to paving. If paving has occurred prior to installing the utilities, jacking or boring is required. It is preferred to jack and bore utilities under all existing paved roads, but open cut excavation is allowed if the pavement cut width is a minimum of 15-feet wide across the entire width of the road. Install new utilities that connect to existing utilities located under existing pave area by open cut excavation. A minimum 15-foot pavement cut width is required for all open cut excavations.

The WT Complex Barracks contractor shall coordinate with the appropriate government agency and/or Joint Base Lewis-McChord representative (s) at the installation regarding any anticipated street closing prior to utility connection work that cannot be accomplished through the jack and bore method, where applicable.

- (h) Utility Outages: All utility outage request dates and times will be set by the appropriate government agency at Joint Base Lewis-McChord. Each individual outage request (according to the type of outage) will be set for either normal working hours or after hours/weekends. Outages shall be coordinated on a case by case basis through the contracting officer or appropriate government agency. Utility outages frequently affect more than one facility and require extensive coordination. The combined CO/BnHQ and SFAC facility contractor shall perform all tests, have passed all inspections as required in the specifications and/or on the project drawings and coordinate between the contracting officer and/or their representative(s) and government shops prior to requesting the utility outage. The combined CO/BnHQ and SFAC contractor performing the work related to the necessary outages shall submit all requests for outage 14 days prior to the utility outage requested date for government approval.
- (i) Traffic Diversion/Street Closings: Traffic diversions and street closing are not anticipated as necessary for the construction of the combined CO/BnHQ and SFAC facility. The contractor shall make arrangements satisfactory to the appropriate government agency at Joint Base Lewis-McChord for the diversion of traffic. The contractor shall notify the appropriate government agency and the fire department headquarters when any street is closed or obstructed. The contractor shall submit all request for traffic diversion and/of street closings 14 days prior to actual diversion/closing of street(s) for government approval.
- 6.4.6.2 Sanitary Sewer Service: The combined CO/BnHQ and SFAC facility contractor shall connect the building service line to the lateral service line placed by the WT Complex Barracks contractor to service the building. Refer to Appendix "C" for proposed connection point.

6.4.6.3 Water Service

(a) General: Provide material for and installation of water system to provide for domestic use and required hydrant flow to meet NFPA 24 and NFPA13. NFPA 13 requires clearances around the main riser to prevent damage of piping subjected to earthquakes. Provide water service and fire lines of ductile-iron pipe or polyvinyl chloride (PVC) plastic water main pipe. Provide water service appurtenances as required. Do not install utilities under the footprint of a building. The contractor shall supply a fire-line off the domestic water system with PIV with tamper switch per NFPA 24 standards to supply the building's interior fire suppression system.

6.4.6.3

(d) Under separate contract, the fire hydrants for the WT Complex have been provided by the WT Complex Barracks contractor. For locations, refer to the utility drawing provided in Appendix "C". The contractor shall provide a fire department connection within 150 feet of a fire hydrant and install PIV valve. The following hydrant specification is for information only. All fire hydrants will be center stem-dry barrel, and paint the barrels nutmeg brown. PANTONE 18-1222 PTX. Install hydrants with 6-inch shutoff gate valve for easy maintenance and service. Fit fire hydrants with 5-inch Stortz adapters. Hydrants shall not be further than 40 feet from the building, and no closer than 25 feet. Locate them not less than 3 feet and no more than 7 feet from a paved traffic rated surface. Do not locate closer than 10 feet to any obstruction or near an entranceway. Install the suction connection perpendicular to the nearest roadway.

6.4.6.4 Gas Service

- (a) General: Puget Sound Energy (PSE), 888-321-7779, owns and operates the gas distribution system on JBLM. Therefore, local utility standards as determined by PSE for installation of natural gas facilities shall take precedence over any references made in this document to natural gas facilities installation methods, means, and materials. Provide all meters with a pulse meter sensor compatible with the JBLM DDC/BAS/UMCS system for monitoring. JBLM owns and operates the propane fuel distribution system. The contractor shall be responsible for coordinating and contracting with PSE for the installation of the natural gas piping up to and including the meter to all facilities at their respective location on site. Coordinate and contract with PSE for the installation of the natural gas piping up to and including the meter to all facilities at their respective sites. Include the PSE's installation cost, including meter, in the contract price. Provide the meter with equipment to connect to DDC/BAS/UMCS system for monitoring. See Appendix "C" for exhibit representing the location of the proposed natural gas connection point.
- (c) Propane Fuel Distribution System: Existing propane was not in the vicinity of the WT Complex Site. Propane Facilities are not required for this site.
- (d) Utility Pads: The combined CO/BnHQ and SFAC facility contractor shall be responsible for installation of all concrete utility pads located outside the CO/BnHQ and SFAC facility building exterior for any mechanical or utility device needed for the operation and function. Include all necessary piping, wiring, or utility extensions for the device to function as designed. Locate mechanical equipment next to existing or proposed sidewalks, pathways, or parking areas to

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eliminate the need to construct additional hard surface access. All utility pads with equipment shall meet antiterrorism/force protection standards.

- 6.4.8.1 Obtain borrow material from licensed and permitted sources off government property. All fill is to be obtained off post at the contractor's expense. See 6.17.1 for disposal of material.
- 6.4.10. Clearing and Grubbing, (a), (b), (c), (d): The overall site clearing and grubbing has been accomplished by the WT Complex Barracks contractor as part of development of the site.
- 6.4.11 Landscaping: The combined CO/BnHQ and SFAC contractor is responsible for the landscaping within the project construction limits as indicated in Appendix "J". The overall site landscaping had been previously designed by the WT Complex Barracks contractor up to the limits of construction of the combined CO/BnHQ and SFAC facility and the approved plan is included in Appendix "J". To maintain continuity within the WT Complex, landscaping within the combined CO/BnHQ and SFAC facility limits of construction must match the overall site landscape provided by the WT Barracks Contractor for the overall WT Complex.
- 6.4.11.1. Tree Preservation Plan: The Tree preservation and Protection Plan was accomplished by the WT Complex Barracks contractor. The overall site clearing and grading was accomplished by the WT Complex Barracks contractor. A Tree Preservation Plan must follow JBLM Urban Forest Management requirements included in Appendices AA and BB.

Replace oak trees that cannot be preserved at the ratio of six new to every (1) one removed. Contact the Contracting Officer for guidance on locations for planting new oak trees on JBLM.

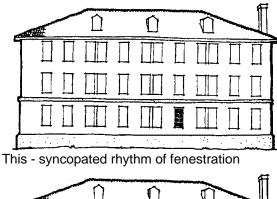
- 6.5.3.3 Authorized Locksmiths: The following locksmiths are currently approved by the Fort Lewis Public Works Lock Shop to combinate cores for locksets used in this project. Verify that authorization remains current prior to beginning lock/core related work on this project.
- (a) Bassett Services: POC: Bob Bassett, 2111 Hernlock Ct SE, Lacey, WA 98503 (360) 239-4416
- (b) PD Services Unlimited: POC: Pam Johnson, 9508 356th St. S., McKenna, WA 98558 (360) 359-0811
- (c) Security Unlimited: POC: Mike Pennella, 8205 E. Martin Way #188, Olympia, WA 98516 (360) 351-1774 (cell)
- 6.9.1. Site Power: Under separate contract, electrical infrastructure for the WT Complex site has been provided by the WT Complex Barracks contractor. For power connection locations, refer to the utility drawing provided in Appendix "C". Section 01 10 00 subparagraphs 6.9.1.2 through 6.9.1.8 of the RFP are included for information only.

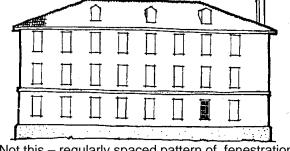
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6.9.2. Site Telecommunications: Under separate contract, telecommunication infrastructure for the WT Complex site has been provided by the WT Complex Barracks contractor. For connection locations, refer to the utility drawing provided in Appendix "C". Section 01 10 00 subparagraphs 6.9.2.1 through 6.9.2.2 of the RFP are included for information only.

6.9.3. Site Lighting: Under separate contract, the WT Complex Barracks contractor has provided site lighting for the WT Complex Site outside of the combined CO/BnHQ and SFAC facility limits of construction. The combined CO/BnHQ and SFAC facility contractor shall provide site lighting within the limits of construction. To maintain continuity within the WT Complex, the site lighting within the limits of construction shall match site lighting provided by the WT Complex Barracks contractor for the overall WT Complex.

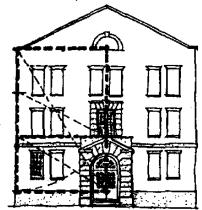
Figure 1 Syncopated Rhythm of Building Elements (Illustrates the required syncopated rhythm of fenestration that helps break up the apparent mass of a building, compared with a regular pattern which can be monotonous)





Not this – regularly spaced pattern of fenestration

Figure 2 - Golden Section (Illustrates use of the Golden Section (a/b=1.618) in determining proportion and massing of Fort Lewis facilities)



Section: Appendix DD

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APPENDIX DD

DEMARCATION MATRIX

DEMARCATION MATRIX

Item of	Private Utility Company	Barracks and Site Development	Admin Facilities Building
Demarcation	Scope/Limit of Work	Contract Scope/Limit of Work	Contract Scope/Limit of Work
Site Grading	NA	Provide site grading to pad elevations shown on Site drawings. This will include site features required to provide overall site/pad elevations for primary buildings including the Barracks, Co/BnHQ, and SFAC. Positive drainage should be provided for the site to prevent ponding or standing water. For the Barracks and misc. site Building(s) - provide foundations, floor slab systems (ground or structurally-supported), and select backfill (nonexpansive) required per geotechnical recommendations. Contractor will be responsible for ensuring proper compaction under barracks building per the recommendations provided by Contractor's Geotechnical consultant.	Provide foundations, floor slab systems (ground or structurally-supported), and select backfill (nonexpansive) required per geotechnical recommendations. Contractor will be responsible for ensuring proper compaction under buildings per the recommendations provided by Contractor's Geotechnical consultant
Emorgonov	NA	Contractor shall construct per DED	NA
Emergency Access Roads	INA	Contractor shall construct per RFP documents.	NA
Permits	NA	Contractor will obtain: Overall SWPPP Gas Tie-in	Contractor will obtain any building specific permits for each building. Contractor shall be secondary permittee for SWPPP
Storm Water Collection/ Detention	NA	Contractor will provide storm water collection/detention for overall site in accordance with specifications and all federal, state and local regulations; and will reroute existing drainage impacted by construction. Contractor to provide storm service connection stub for every building proposed in the complex. Temporarily cap service at the building construction limit. Contractor to accommodate roof drains to surface splash blocks and/or below grade storm water collection system(s) for barracks and all other site buildings not within the Admin Facilities or DFAC contracts.	Contractor to accommodate roof drains to surface splash blocks and/or below grade storm water collection system(s).
Natural Gas	Gas is owned and operated by Puget Sound Energy (PSE) and is available within the project limits of the site.	Contractor shall provide natural gas system as per contract documents. Contractor shall coordinate with Department of Public Works (DPW) and Puget Sound Energy (PSE) for service and provide gas line from connection	Connect to Natural Gas at the building limit of construction and provide piping and meter as required per RFP.

Item of Demarcation	Private Utility Company Scope/Limit of Work	Barracks and Site Development Contract Scope/Limit of Work	Admin Facilities Building Contract Scope/Limit of Work
		point to the barracks building and any piping required within the facility. Contractor will provide gas line from connection point to the Co/BnHQ and SFAC building construction limit.	
Domestic Water Distribution	N/A	Contractor is responsible for coordination regarding size and location of service.	Contractor is responsible for coordination regarding size of service. Refer to Appendix "C" site layout/utility plan for connection point location.
Fire Water Distribution	N/A	Contractor is responsible for coordination regarding size and location of service.	Contractor is responsible for coordination regarding size of service. Refer to Appendix "C" site layout/utility plan for connection point location.
Sanitary Sewer	N/A	Contractor is responsible for coordination regarding size and location of service.	Contractor is responsible for coordination regarding size of service. Refer to Appendix "C" site layout/utility plan for connection point location.
Primary Electrical Service	N/A	Contractor is responsible for coordination regarding electric requirements and location of transformer.	Contractor is responsible for coordination regarding electric requirements. Refer to Appendix "C" for location of concrete transformer vault. Contractor shall provide primary electric service from electric meter to the building. Building Contractor will provide: • secondary conductors • secondary conduit • grounding at transformer
Communications Duct Bank	NA	Contractor will provide duct bank and cabling for the site from the nearest connection point as shown in the RFP. Provide each proposed buildings within the WT complex service to the building construction limit. Contractor will coordinate with DOIM for capacity and connection locations. Include duct space in the duct bank for cable, phone and data.	Contractor will provide duct bank and cabling from the building construction limit into the communications room.

Item of Demarcation	Private Utility Company Scope/Limit of Work	Barracks and Site Development Contract Scope/Limit of Work	Admin Facilities Building Contract Scope/Limit of Work
Phone Cabling – Copper	Phone service provided by Qwest.	Contractor will provide phone/copper lines, within duct bank installed from the communication tie in point manhole to the barracks building and any copper/phone elements required within the facility. Provide service entrance termination hardware. Contractor will provide phone/copper lines, within duct bank installed from the communication tie in point manhole to the Co/BnHQ and SFAC building construction limit.	Contractor will provide ducts and phone/copper lines from the building construction limit to the building and any copper/phone elements required within the facility. Provide service entrance termination hardware.
Data Cabling – Fiber	NA	Contractor will provide cabling/fiber from the nearest connection point to each building construction limit and terminate on the service entrance termination. Contractor will provide any data cabling/fiber from the manhole and elements required within the Barracks. Provide service entrance termination hardware at Barracks.	Contractor will provide any data cabling/fiber elements required within the facility. Provide service entrance termination hardware.
Cable Television	Phone service provided by Comcast.	Contractor will provide outlet locations including backbox, mud ring, and raceway. Contractor will provide vertical/horizontal coaxial cable, wire management including, but not limited to, labeling and identification. Contractor to provide faceplates for coaxial terminator to be installed by Local Service Provider.	Contractor will provide outlet locations including backbox, mud ring, and raceway. Contractor will provide vertical/horizontal coaxial cable, wire management including, but not limited to, labeling and identification. Contractor to provide faceplates for coaxial terminator to be installed by Local Service Provider.
DDC/BAS/ EMCS	NA	Contractor will provide any cabling/fiber elements, integrating new system information and new software required to connect and integrate new building EMCS for all equipment and systems into the existing EMCS.	Contractor will provide any cabling/fiber elements, integrating new system information and new software required to connect and integrate new building EMCS for all equipment and systems into the existing EMCS.
Building Identification	NA	Contractor will provide Barracks Complex signage and site signage for the entire complex to include individual building signage that is not building mounted.	Building mounted number signage is to be provided and installed by the building Contractor.
Sidewalks	NA	Contractor will provide all site sidewalks to the building construction limits.	Contractor will provide sidewalks, covered walkways, building stoops and handicap ramps within building

Item of Demarcation	Private Utility Company Scope/Limit of Work	Barracks and Site Development Contract Scope/Limit of Work	Admin Facilities Building Contract Scope/Limit of Work					
		Contractor will provide building stoops and handicap ramps at barracks.	construction limits.					
Parking Lots /Parking Structures	NA	Contractor shall construct per RFP documents.	NA					
Landscaping	NA	Contractor will provide landscaping within the building construction limits including seeding and entrance plantings. Refer to Appendix "J" Landscape Planting Sketch.						
Trash Dumpster	NA	Contractor shall construct per RFP documents. Contractor to define dumpster locations for Barracks and Admin Facilities.	NA					
Site AT/FP Elements	NA	Contractor will provide any site AT/FP elements for the entire site and ensure minimum setback distances are established and maintained.	Contractor will provide any required AT/FP elements within the building construction limit.					
Equipment Pads (Condensers, Chillers, etc) (if required)	NA	Contractor shall provide all equipment pads located outside of the barracks building exterior.	Contractor shall provide all equipment pads located outside of the Co/BnHQ and SFAC building exterior.					
Oil/Water Separator, grease interceptors	NA	NA	NA					
Fencing and gates	NA	Contractor to provide fencing and gates around the site as required for the Barracks except where they fall within the Co/BnHQ and SFAC building construction limit.	Contractor to provide fencing and gates as required within the building construction limit.					
Sustainability, LEED building/site interface	NA	Responsible for registration of project with USGBC and documentation of points attained for LEED. Responsible for site related portion of combined bldg/site LEED Credits.	Responsible for building related portion of combined bldg/site LEED Credits.					
Site/Security Lighting	NA	Contractor to provide and install all building, general area, parking, security, and pedestrian lighting for the entire site as required except where they fall within the Co/BnHQ and SFAC building construction limit. Contractor to provide any building mounted lights and	Contractor to provide any building mounted lights and provide a manual switch for exterior lights controlled by photocell.					

Item of Demarcation	Private Utility Company Scope/Limit of Work	Barracks and Site Development Contract Scope/Limit of Work	Admin Facilities Building Contract Scope/Limit of Work
		provide a manual switch for exterior lights controlled by photocell.	
Gate Controls	NA	Contractor to provide gate controls where applicable.	NA
Chill Water	NA	N/A	N/A



F.1 INTRODUCTION

The Installation Design Guide brings together design standards and installation-specific requirements for project development. This foreword includes design principles developed by the installation community as part of the 2007-2008 revised master plan and specific system requirements to guide the development of construction projects (contract betterments by building type and chapter 6 – Project Specific Requirements template for Fort Lewis as part of the standard MILCON Transformation RFP.) Where information in the design guide and this foreword conflict, the foreword shall govern.

F.2 FORT LEWIS PLANNING VISION / GOALS

In August 2007 The Urban Collaborative, LLC through a contract with the Seattle District, US Army Corps of Engineers, facilitated the creation of a planning vision and goals for Fort Lewis that will guide all future development.

The Fort Lewis Planning Vision is:

In support of the mission, our soldiers and families, we will create a sustainable community of walkable neighborhoods with identifiable town centers connected by great streets.

The following goals support the planning vision:

- 1. Enhance Mission Capabilities
- 2. Sustainable Community

- 3. Walkable Neighborhoods
- 4. Identifiable Town Centers
- 5. Great Streets

F.3 DESIGN PRINCIPLES

These design principles are guidelines that define design elements to ensure that Fort Lewis planning goals and vision are achieved. Weigh all design elements against these principles to ensure that they are followed and that none are violated. If a design decision is required, utilize these principles to create a decision matrix that facilitates the design direction decision.

F.3.1 MULTI-WAY BOULEVARD: The multi-way boulevard provides unimpeded public transit, lanes for thru traffic, and side access lanes for local traffic, bicyclists, and on-street parking. Landscaped medians separate the lanes and provide places for closely-spaced street trees, storm water recharge, and dedicated turning lanes.

This principle supports the Design Goals Sustainable Communities, Walkable Neighborhoods, and Great Streets

F.3.2 MAIN STREET: Main streets create a pleasant community connector with multi-story buildings, storefront windows, wide sidewalks, and street trees.

This principle supports the Design Goals Walkable Neighborhoods, Identifiable Town Centers, and Great Street

F3.3 PUBLIC TRANSIT: Public transit enables sustainable communities by reducing traffic, decreasing emissions, and providing opportunities for soldiers and families to easily and efficiently commute within the installation. Public transit can also connect Ft. Lewis to the surrounding community.

This principle supports the Design Goals Sustainable Communities.



Figure 1 Multi-Way Blvd



Figure 2 Main Street



Figure 3 Public Transit

F3.4 STREET CAFES: Encourage local street cafes in each neighborhood. Make them intimate places with several rooms, open to a busy path where people can sit with a drink and watch the world go by. Build the front of the café so that a set of tables stretch out of the café into the street.

This principle supports the Design Goals Great Streets.

F3.5 REGIONAL CHARACTER: Regional Character means architecturally compatible buildings that help create a unique and unified environment. Compatible buildings share similar materials, style, shape and color while varying, using contrast and accents to ensure there is no monotony. Regional and local resources should be studied in evaluating existing themes. Use natural materials that are native to the region. Colors and textures shall be warm in hue and also be reflective of the region. Architectural details shall clearly convey the military hierarchy, with higher headquarters buildings being more finely detailed with richer materials to clearly convey their prominence. Details and type of construction should be characteristics of the area.

This principle supports the Design Goals Identifiable Town Centers.

F3.6 ON-STREET PARKING: On-street parking plays a crucial role in benefiting activity centers. On-street parking is more convenient, uses less space, slows traffic down so it's safer for pedestrians, and helps to create an atmosphere that encourages more walking, biking and use of public transportation, making for a healthier, busier downtown.

This principle supports the Design Goals Great Streets.

F3.7 ALIGNED ENTRIES: Whenever possible, align entries to buildings to create a clear geometry. This will help with wayfinding, reduce pedestrian travel time and aid with the goal of defining entries.

This principle supports the Design Goals Great Streets and Walkable Neighborhoods.



Figure 4 Street Cafes



Figure 6 Regional Character



Figure 5 On-Street Parking



Figure 7
Aligned Entries

F3.8 BULB-OUTS: Bulb outs are a traffic calming measure, intended to slow the speed of traffic and increase driver awareness. They also allow pedestrians and vehicle drivers to see each other when vehicles parked in a parking lane would otherwise block visibility. Recommend siting at pedestrian crossings where the effect of the narrowed roadway shortens the exposed distance pedestrians must walk.

This principle supports the Design Goals Great Streets and Walkable Neighborhoods.

F3.9 PARKWAYS: Incorporating two sidewalks and the roadway, separated from each other by rows of trees, parkways have many variations of design. More than a wide street that moves cars from place to place, parkways can become a destination of their own, as a landscaped place for the eye to rest, a retail, business or residential address, or a comfortable place to walk.

This principle supports the Design Goals Great Streets and Sustainable Communities.

F3.10 PLANTING STRIPS: Planting strips create a buffer between the pedestrian and vehicles, creating a safer, less noisy and healthier walk. In addition, they reduce storm water run-off and can be used to emphasize key signs and signals to traffic. When planning new streets, standard planting strips should ideally be 8 feet wide, and a minimum of 6 feet wide. Planting strip widths of 4-5 feet are acceptable in very constrained conditions. Maintain local clear vision areas - usually an area between 36" and 96" - near driveways and intersections.

This principle supports the Design Goals Sustainable Communities and Walkable Neighborhoods.

F3.11 SHOP FRONTS: 80% of the front exterior finish on a retail / community building should be glazed windows, in an effort to attract pedestrians and create an interesting entry. Glazing also increases the pleasure of shopping and dining by bringing more natural light into the sales area and affording views out as well. Locate functions not needing windows (bathrooms, storerooms, video arcades, etc) away from the exterior and locate smaller sales areas (beauty shop, jewelry shop, optometry, coffee) at the exterior so they can have storefront windows.

This principle supports the Design Goals Great Streets and Walkable Neighborhoods.



Figure 8
Bulb Outs



Figure 9 Parkways



Figure 10 Planting Strips



Figure 11 Shop Fronts

F3.12 GREAT VIEWS: Great Views speak for themselves. Incorporate them whenever possible to terminate a road, provide a refreshing look out of an important building or a clear view from a public green space.

This principle supports the Design Goals Great Streets and Walkable Neighborhoods.

F3.13 CLEAR EDGES: Buildings with clear edges provide definition for exterior spaces. The transition should not be harsh, however. Soften the hard edges of these facades with inviting storefronts, landscaping, verandas, covered walkways and other human-scale elements and penetrations for activities to occur.

This principle supports the Design Goals Identifiable Town Centers, Great Streets and Walkable Neighborhoods

F3.14 BIKE-ABLE / BIKE PATHS: Creating bikeable, walkable communities with bike paths enhances connections, and serves to tie communities together. Effective pedestrian and bicycle networks also serve to substantially reduce congestion by reducing trip generation. Bike lanes on benefit not only the cyclist, but both the pedestrian and motorist as well. By providing for needed separation between the roadway and the pedestrian, and providing a clear demarcation of lanes for the motorist.

This principle supports the Design Goals Great Streets and Sustainable Communities.



Figure 12 Great Views



Figure 13 Clear Edges



Figure 14 Bike-able/Bike Paths

F3.15 LINEAR PARKS: Frederick Olmstead once said, "We want a ground to which people may easily go after the day's work is done." A linear parks system contributes to the overall well being of the community by providing a wide variety of year round recreational opportunities. Linear parks provide convenient access to natural spaces and an amenity that enhances neighbourhoods. They are part of an overall non-motorized transportation system that provides connectivity throughout the community. Park corridors are generally a minimum of 10 metres wide, with a 5 meter buffer, on slopes that can be accessed by the average pedestrian.

This principle supports the Design Goals Sustainable Communities and Walkable Neighborhoods

F3.16 FOCAL POINTS: Focal points should be used to draw interest and terminate paths. They become goals to walk to. Paths without focus tend to be dull and feel too exposed. Scale these focal points to the space they terminate or highlight. Small space foal points may include fountains, sculptures, gardens or trees. Large ones may be aircraft displays, flags, towers, or buildings.

This principle supports the Design Goals Identifiable Town Centers and Great Streets.

F3.17 STREET GRID: Confusing traffic patterns are unsafe and inconvenient. The simple solution is often the best. Two-way streets, street grid patterns and 90 degree T intersections are effective strategies. Also, consider origin and destination points when laying out the street network. Terminate main streets with key buildings and separate the pedestrian traffic from the streets.

This principle supports the Design Goals Sustainable Communities and Walkable Neighborhoods.

F3.18 VISIBLE ENTRIES: Have you ever wasted time wondering where a building's entry was? Recessed entries, hidden entries, and poorly scaled entries make finding the front door difficult. Entries should be visible from all directions and lines of sight. Visible Entries can be achieved by making the entry protrude from the main body of the building.

This principle supports the Design Goals Great Streets and Walkable Neighborhoods.



Figure 15 Linear Parks



Figure 16 Focal Points



Figure 17 Street Grid



Figure 18 Visible Entries

F3.19 CAR PARKS: Seas of asphalt are major eyesores on Ft Lewis. They are unpleasant to view, uncomfortable to walk through and create significant storm water run-off. Make these places more like a garden, a car park. Between every parking aisle, create a planted aisle full of trees, grass and shrubs. Plant the trees so that they will eventually form a canopy over the parking aisles. Allow drainage from the paved area to pass through the curbs and into the landscaped areas.

This principle supports the Design Goals, Great Streets and Sustainable Communities.

F3.20 CONNECTED SIDEWALKS: Disconnected sidewalks discourage walkability and pose a safety risk. Connect sidewalks throughout the installation to provide pleasant, safe walkways with clear destination points.

This principle supports the Design Goals Sustainable Communities, Great Streets and Walkable Neighborhoods.

F3.21 HIDDEN PARKING: Save the fronts of buildings for people! Hidden parking by parking behind, rather than in front of commercial facilities allows buildings to be at or near the sidewalk's edge—more welcoming and pedestrian friendly than a building in an asphalt ocean. Consolidate parking into well-landscaped lots behind or to the side of buildings in order to create pleasing streetscapes, share ATFP standoff distances and encourage walking in the clustered building areas. On-street parking can be used to reduce demand and size of lots.

This principle supports the Design Goals Sustainable Communities and Walkable Neighborhoods.



Figure 19 Car Parks



Figure 20 Connected Sidewalks

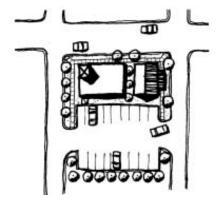


Figure 21 Hidden Parking

F3.22 SIDEWALK BUILDINGS: Sidewalk buildings define streets, provide attractive pedestrian ways, and slow vehicle traffic. In addition, bringing buildings as close as possible to the street saves valuable land resources and minimizes sprawl.

This principle supports the Design Goals Sustainable Communities, Identifiable Town Centers, Great Streets and Walkable Neighborhoods.

F3.23 NARROW BUILDINGS: Wide buildings create unpleasant work environments, are difficult to navigate and expensive to maintain. Longer and taller buildings allow natural light on both sides of the building, promoting environmental sustainability. Narrow buildings also help define exterior spaces and allow "eyes on the street" for AT/FP measures. Make each wing as narrow as possible, less than 60'.

This principle supports the Design Goals Sustainable Communities and, Great Streets.

F3.24 STREET TREES: Street trees provide shelter from the elements, clean the air, reduce noise, provide street definition, buffer pedestrians, reduce vehicle speeds and create an attractive environment. In addition, they create cost savings by reducing storm drainage infrastructure and improving pavement life through temperature regulation. Whenever possible, plant street trees 8 to 10 meters on center in a planting strip 1 to 2 meters wide between the curb and sidewalk. When careful thought is given to location of trees near signals and signage, trees actually improve visibility.

Sustainable Communities, Great Streets and Walkable Neighborhoods.

F3.25 TOWN SQUARE: Fort Lewis needs a unifying element, a place where people can gather to create a sense of community. A town center is a feature like an open space, an important avenue, a built square, or a natural feature that sets the tone for the built environment. Ft Lewis Town Center will center around a large open space enclosed by mixed-use buildings that may include places to shop, dine, worship, work, and play.

Identifiable Town Centers and Walkable Neighborhoods.



Figure 22 Sidewalk Buildings



Figure 23 Narrow Buildings



Figure 24 Street Trees



Figure 25 Town Square

F3.26 MIXED-USE: Single use facilities contribute to inefficient land use (sprawl) because they force construction of small, single story facilities with their own ATFP standoff. Compatible functions should be collocated in mixed-use facilities. Mixed use facilities are economically and environmentally sustainable, use land more efficiently, and support vertical construction and compact development.

Sustainable Communities, Great Streets and Walkable Neighborhoods.

F3.27 MULTI-STORY BUILDINGS: Single-story buildings are also a primary contributor to sprawl. With large footprint and parking combined, they do nothing to increase density and community and do not define the street or provide a feeling of protection to pedestrians. When in the core of the installation, use multi story buildings and place the more public functions on the ground level and private functions above.

This principle supports the Design Goals Sustainable Communities, Identifiable Town Centers, Great Streets and Walkable Neighborhoods.

F3.28 COMPACT DEVELOPMENT: Planning using compact development as a guideline ensures that critical resources like land, money and time are not used unnecessarily for facilities and infrastructure. They can then be applied to mission enhancing pursuits.

This principle supports the Design Goal Enhance Mission Capability.

F3.29 RANGELAND PRESERVATION: Training is the cornerstone of readiness. Integral to this is the lands on which this training is performed. Greenfield development methods of the past have encroached on the rangelands at Ft Lewis. A focus of any planning effort on the installation must focus on rangeland preservation for this most mission critical activity. No encroachment is acceptable and providing room for future expansion is the goal.

This principle supports the Design Goal Enhance Mission Capability.



Figure 26 Mixed-Use Facilities



Figure 27 Multi-Story Buildings



Figure 28 Compact Development



Figure 29 Rangeland Preservation

F3.30 EFFICIENT TRANSPORTATIONN: A logical, direct and efficient transportation network not only makes the morning commute less frustrating, it enables soldiers to spend less time in their cars and more time impacting the mission. In addition, it improves safety, force protection and facilitates rapid deployment of people and equipment.

This principle supports the Design Goal Enhance Mission Capability.

F3.31 CLOSE-IN TRAINING: Ft Lewis suffers from a lack of appropriate training areas located within the cantonment area, known as close-in training. Emphasis must be placed on locating open areas for PT and other daily outdoor training close to company operations facilities to accommodate this mission requirement.

This principle supports the Design Goal Enhance Mission Capability.

F3.32 AFFORDABLE DEVELOPMENT: Focus must be placed on planning affordable development. Applying sustainable design principles minimizes initial infrastructure costs and future maintenance costs of roads, utilities and stormwater management. A careful analysis is required when choosing building materials to ensure the proper balance is found between cost and long-lasting construction. This is critical to ensuring Ft Lewis maximizes the dollars it receives to provide the best environment for its soldiers.

This principle supports the Design Goal Enhance Mission Capability.

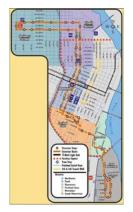


Figure 30 Efficient Transportation

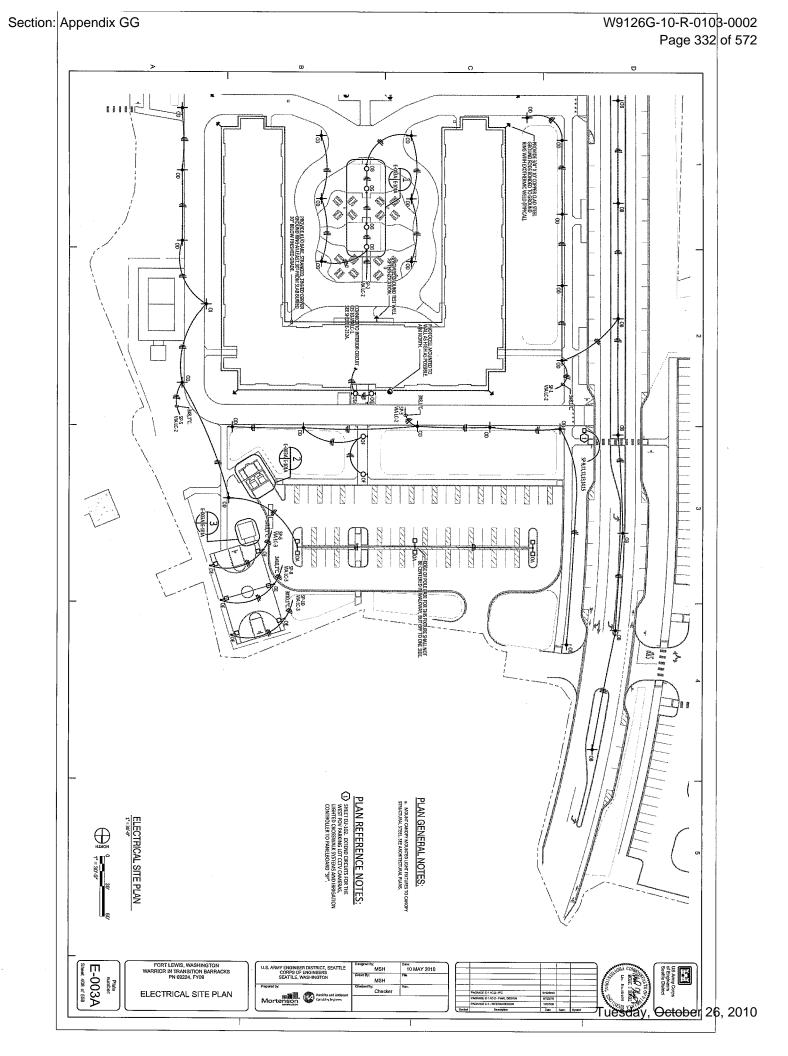


Figure 31 Close-In Training



Figure 32 Affordable Development

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Warrior in Transition Barracks Fort Lewis, Washington

FY 09, PN 69224

Part 2 – Design Requirements and Provisions

A12. LEED/Sustainability Narrative

 Sustainable design principles and concepts have been incorporated into the design of the WT Barracks. A USGBC LEED Silver Certification under the LEED-NC Version 3.0 (2009) is targeted to be achieved for this project.

For participation in the LEED Green Building Rating System, all prerequisites must be met. In addition to these prerequisites, a minimum 50 additional LEED credits will be achieved to meet the Silver Certification level. A point-by-point LEED Checklist Chart and brief narrative has been developed as part of this submittal and is included in this section.

Page 1 of 2

Warriors in Transition Barracks Fort Lewis, Washington LEED 2009 for New Construction

Yes Maybe? No Credit Name	Credit Name Pre-requisite 1: Construction Activity Pollution Prevention Credit 1: Site Selection Credit 2: Development Density and Community Connectivity Credit 3: Brownfield Development Credit 4: Alt. Transportation, Public Transportation Access Credit 4: Alt. Transportation, Public Transportation Access Credit 4: Alt. Transportation, Bicycle Storage & Changing Rooms Credit 4: Alt. Transportation, Low-Emitting and Fuel Efficient Vehicles Credit 4: Alt. Transportation, Parking Capacity Credit 5: Site Development, Protect or Restore Habitat Credit 5: Site Development, Maximize Open Space Credit 6:1: Site Development, Maximize Open Space Credit 6:1: Stormwater Design, Quantity Control Credit 6:2: Stormwater Design, Quantity Control Credit 7:1: Heat Island Effect, Roof Credit 8: Light Pollution Reduction Pre-requisite 1: Water Use Reduction - 20% Reduction	Project site is not considered prime farmland. Project site is five feet or more above 100-year flood elevation. Project site contains no habitat for threatened or endangered species. No portion of project site lies within 100 feet of any water, wetlands or areas of special concern. Project site was not previously used as public parkland. Documentation from government confirming that that the project site does not meet any of the prohibited criteria will be provided government confirming that that the project site does not meet any of the prohibited criteria will be provided provided documentation showing that at least 10 basic services are available for use by building occupants within 1/2 mile radius. Project site does not meet the criteria for this credit Provide documentation showing that bus stop serves at least 2 public bus lines usable by building occupants within 1/2 mile and sold bicycle parking for low emitting and tuel efficient vehicles will be provided Covered bicycle parking for low emitting and tuel efficient vehicles will be provided Occupancy count and total parking darpating for the site. AND description of the infrastructure/programs that are in place to support and promote ridesharing will be provided Project site does not meet the criteria for this credit Site had and calculations showing pre- and post-development site run roof rates and quantities will be provided Project does not meet the criteria for this credit Area of installed SRI compliant roofing materials and their SRI values (> SRI 29 for steep-sloped roof) will be provided Area of installed SRI compliant roofing materials and their SRI values (> SRI 29 for steep-sloped roof) will be provided Interior and site lighting drawings to document location and type of fixtures installed, and complete the Lighting Power Density tables will be provided
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Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y		
4 2 2 2 Y Y Y Y Y Y Y Y 3 3 3 3 3 3 3 3 3		Calculations of baseline water consumption and design water consumption will be provided
2 2 2 Y Y Y Y Y Y Y 3 3 3 3 3 3	ndscaping	Reduction in potable water usage in landscape irrigation by 50% will be provided
2 2 7 Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	vater Technologies	Project does not meet the criteria for this credit
Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	ion - 30%, 35% or 40% Reduction	Calculations of baseline water consumption and design water consumption, determine level of additional reduction that is possible
7 7 7 9 9 3 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3		
Y Y Y 10 9 9 3 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3	Pre-requisite 1: Fundamental Commissioning of the Bldg Energy Systems	Provide narrative description of the systems that were commissioned and the results of the commissioning process will be provided
Y 10 9 3 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nergy Performance	Project meets the requirements of ASHRAE Std. 90.1-2004
10 9 7 7 2 2 2 3 3	al Refrigerant Management	Project does not use CFC refrigerants
3 2 2 7	erformance	Calculations demonstrating percent savings (30% for 10 points) will be provided
	Energy	Project does not meet the criteria for this credit
丁	ssioning	Project does not meet the criteria for this credit
	ant Management	Project does not meet the criteria for this credit
1	ərification	Project does not meet the criteria for this credit
2 Credit 6: Green Power		35% of the project's electricity will not be provided through an Installation renewable energy contract.
T	Pre-requisite 1: Storage & Collection of Recyclables Credit 1: Building Douis Mainfain EE, 758, or 058, of /E\ Wallo Election 9 Boofs	Floor plan indicating area of recycle storage will be provided.
Т	Maintain 50%, 15% of 35% of [5] walls, Flours & Rouls	No boilining result of this project. No boilining result of this project. MA Evillar.
Credit 1.2: Building Keuse, Matinain 30	Credit 1.2. Bulliang Reuse, Mainain 30% of Interior Non-Structural Elements Credit 2: Construction Waste Management Divert 50% or 75% from Disnosal	No buliquing resule for this project. Construction waste calculations and narrative describing construction waste measurement annound (7789), will be required
2		Project does not meet the criteria for this credit
*		Tabulation of materials with recycled content will be provided: gypsum board (50%), steel studs (90%), acoustical ceiling tile
-	Credit 4: Recycled Content, 10% or 20% (post-consumer + 1/2 pre-consumer)	(50%), rebar (95%), concrete (25%), masonry (25%), insulation (90%), and asphalt

Page 2 of 2

Warriors in Transition Barracks Fort Lewis, Washington LEED 2009 for New Construction

-	-	-	Credit 5: Regional Materials, 10% or 20% Extracted, Processed & Manufactured Region	Extracted, Processed & Manufactured Regio Tabulation of regional materials used will be provided: Masonry (100%), concrete (100%), asphalt
•		-	Credit 6: Rapidly Renewable Materials	Tabulation of rapidly renewable materials used will be provided: (2.5% of material cost required for credit) - agrifiber board
				Tabulation of all new wood products on the project and Identify which components are FSC certified (min 50%) will be
		-	Credit 7: Certified Wood	provided
	>		Pre-remisite 1: Minimum IAO Performance	Design narrative will be provided
	>		Pre-requisite 2: Environmental Tobacco Smoke (ETS) Control	Show exterior destanated smoking areas at least 25 feet away from entries, outdoor air intakes and operable windows
	-		Credit 1: Outdoor Air Delivery Monitoring	Provide design narrative describing the project's ventilation design and CO2 monitoring system
4	-		Credit 2: Increased Ventilation	Provide project data and calculations
	-		Credit 3.1: Construction IAQ Management Plan, During Construction	Establish IAQ management plan before construction begins.
•	-		Credit 3.2: construction IAQ Management Plan, Before Occupancy	HVAC system flush out before occupancy
	-		Credit 4.1: Low-Emitting Materials, Adhesives & Coatings	Provide product data of indoor adhesives and sealants used, with specific VOC data
-	-		Credit 4.2. Low-Emitting Materials, Paints & Coatings	Provide product data of indoor paint and coating used, with specific VOC data
Indoor	-		Credit 4.3. Low-Emitting Materials, Flooring Systems	Provide product data of hard suface flooring, concrete sealer and tile setting adhesives
Environmenta	1		& Agrifiber Products	Provide product data of particle board product used, confirming no added urea-formaldehyde
Knamy		-	Credit 5: Indoor Chemical & Pollutant Source Control	Project does not meet the criteria for this credit
	-			Narrative describing the project's lighting control strategy will be provided
	-		Comfort	Narrative describing the project's thermal comfort control strategy will be provided
		-		Project does not meet the criteria for this credit
		-	Credit 7.2: Thermal Comfort, Verification	Project does not meet the criteria for this credit
		-	% of Spaces	Project does not meet the criteria for this credit
		1	S	Project does not meet the criteria for this credit
	1		Gredit 1.1: Innovation in Design: MR Credit 2 Exemplary Performance	Complete construction waste calculations and narrative describing construction waste management approach (95%) will be provided
Innovation &		-	. Gredit 1.2: Innovation in Design: Reduced Water Use for Kitchen/Laundry Equipment	Product data for water saving kitchen and laundry equipment will be provided
nesidu	-			Space for educational signage is provided
Locess	-		Green Cleaning Policy	Documentation on government's green cleaning policy will be provided
		-		Not applicable
	1		Credit 2: LEED Accredited Professional	Certification of LEED AP will be provided
Donoing		1		Applicable if SSc4.2 is satisfied
Driority	1		- SSc4.4	Applicable if SSc4.4 is satisfied
Cradite		-		Not applicable
ello lo		_	Credit 1.4: Regional Priority: Specific Credit	Not applicable

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110 points

28

Total





Design Analysis

Package A: Critical Path Design Package – Site Demolition/Site Grading & Utilities/West POV Parking

Prepared for:
US Army Corps of Engineers
Fort Worth District
Seattle District

Final Design Review November 2009

PN 69224, FY2009 Warriors in Transition Barracks Fort Lewis, WA

Contract #W9126G-08-D-0048, Task Order #0002 Mortenson Project No. 09110010 TranSystems Project No. P501090081

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Appendix 3	Code Review Summary (to be included in Package C-1 submittal)
Appendix 4	Civil Design Calculations
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Appendix 6	Architectural Design Calculations (to be included in Package C-1 submittal)
Appendix 7	Mechanical Design Calculations/Cutsheets (to be included in Package C-1 submittal)
Appendix 8	Electrical Design Calculations (to be included in Package C-1 submittal)
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Appendix 10	Geotechnical Report

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Warriors in Transition Barracks

Fort Lewis, Washington

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PART 1

GENERAL DESCRIPTION

Warriors in Transition Barracks Fort Lewis, Washington

FY 09, PN 69224

Part 1 – General Description

A. Purpose

The primary purpose of this project is to design and construct Warriors in Transition (WT) Barracks facilities, including site work, at Fort Lewis, Washington. The WT Barracks and Site provides lodging for permanent party soldiers who have been released from a medical care facility and are in recovery status for further evaluation.

The WT Barracks is composed of two types of standard 2-bedroom apartment units with either 2bathrooms or 1-bathroom, public toilets, vending, lobby with Charge of Quarters (CQ) station, multipurpose room, storage, laundry and other support areas. In addition to the barracks facilities, there will be a small Lawnmower Storage Building (LSB), covered pavilions, bus shelter, and covered walkways. Site work includes but is not limited to parking, roads, picnic areas, outdoor sport courts, masonry screen walls at existing well pump stations, utilities and demolition.

B. Authority

NWD Regional MATOC, Task Order 0002, Contract Number W9126G-08-D-0048.

C. Applicable Criteria

- 1. The following criteria and mandatory design guidance are applied to the design of the Fort Lewis Warriors in Transition Barracks and Site.
- 2. Department of the Army, Corps of Engineers, Forth Worth and Seattle Districts, Request for Proposal (Design-Build Contract), July 2009. Solicitation No. W9126G-08-D-0047/0048/0049, RFP 0002, including Amendment 1.
- 3. ICC International Code Council, Inc.
 - a. International Building Code (IBC); 2006
 - b. International Energy Conservation Code (IECC); 2006
 - International Fuel Gas Code (IFGC); 2006
 - International Mechanical Code (IMC); 2006
 - International Plumbing Code (IPC); 2006
- 4. UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, 08 October 2003, including change 1, 22 January 2007
- 5. UFC 3-600-01, Design: Fire Protection Engineering for Facilities
- 6. UFC 4-021-01, Design and O&M: Mass Notification Systems, June 2003
- 7. Other Criteria Listed in Part 2 Discipline Narratives

Design Analysis (Package A) Final Submittal General Description Warriors in Transition Barracks Fort Lewis, Washington

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D. **Project Description**

The WT Barracks project site encompasses an approximately 22-acre area within the Main Post of Fort Lewis, Washington. The site is bounded to the south by Jackson Ave, Fitzsimmons Drive to the east, existing parking facilities for the Madigan Army Medical Center to the north, and undeveloped area to the west. Gardner Loop, a portion of which will be widened as a part of this project, runs through the project site, separating the west parking area and the barracks. In addition to the barracks facilities, the project site will also accommodate a future two-story WT Soldier Family Assistance Center (SFAC) and WT Battalion Headquarters (BN HQ) facility (to be designed and constructed under separate contract) to be located south of the Barracks facilities.

The WT Barracks complex will accommodate a total of 408 single personnel, in two barracks (Building 1 and Building 2).

- Building 1: a four-story building accommodating 240 personnel in 102 two-bedroom, twobath and kitchen dwelling modules and 18 two-bedroom, one-bath and kitchen dwelling modules.
- Building 2: a four-story building accommodating 168 personnel in 84 two-bedroom, onebath and kitchen dwelling modules.

All of the modules will be designed to meet circulation requirements for ADA and UFAS. 21 twobedroom, two-bath modules on the first floor of Building 1 will be constructed as "compliant" modules, meeting all UFAS/ADAAG requirements, meeting the minimum requirement for "compliant" modules for 10% of all units.

POV parking facilities will be provided at a new parking lot located west of the Barracks facilities (West POV Lot), along the widened Gardner Loop, north of Building 1 (Accessible Parking Lot), and south of the future SFAC/BN HQ Building.

A central courtyard area will be provided and will be accessible from the two barracks buildings. The courtyard area is designed with 24 secured picnic tables and six outdoor barbecue grilles. Two covered pavilions will provide shade and weather protection for eight of the provided picnic tables. The required emergency access lanes within the central courtyard will also double as a jogging path for barracks residents.

Two types of outdoor sport courts will be provided adjacent to the Barracks facilities, which include a hard surface basketball court located north of the barracks and a sand volleyball court located east of the barracks. The basketball court is located farther away from the barracks to prevent potentially noisy activities from impacting sleeping rooms. Small covered pavilions will be provided adjacent to these sport courts to accommodate gathering of participants and spectators.

Final Submittal General Description

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PART 2

DESIGN REQUIREMENTS AND PROVISIONS

A. DISCIPLINE NARRATIVES

- 1. SURVEY & GEOTECHNICAL
- 2. CIVIL
- 3. ARCHITECTURAL
- 4. INTERIOR DESIGN (to be included in Package C submittal)
- 5. **STRUCTURAL** (to be included in Package B submittal)
- 6. UNDERGROUND PLUMBING (to be included in Package B submittal)
- 7. MECHANICAL AND PLUMBING (to be included in Package C-1 submittal)
- 8. FIRE PROTECTION (to be included in Package C-1 submittal)
- 9. SITE ELECTRICAL AND OUTSIDE PLANT COMMUNICATION
- 10. ELECTRICAL/COMMUNICATIONS (to be included in Package C-1 submittal)
- 11. LANDSCAPING (to be included in Package C-1 submittal)
- 12. LEED/SUSTAINABILITY (to be included in Package C-1 submittal)

Warriors in Transition Barracks Fort Lewis, Washington

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Part 2 – Design Requirements and Provisions

A1. Survey & Geotechnical Narrative

1. Survey

A topographic survey was prepared by TranSystems from field data collected in October 2009. Underground utility information shown are based on a combination of location of above-ground structures, record drawings provided by Fort Lewis Public Works Department and Madigan Army Medical Center Facilities Group.

Horizontal coordinates provided are in US Survey Feet and refer to the Washington State Plane Coordinate System, South Zone, NAD83. Horizontal coordinates were established from the National Geodetic Control Monument "Lewis GP" which is part of the cooperative base network.

Vertical control is based on the North American Vertical Datum (NAVD) of 1988. Elevations were established from the National Geodetic Control Monument "Lewis G". See General Note Sheet Gl003 of the plans set for more detailed benchmark information.

The topographic survey information is used as the base file to generate civil site and utility drawings.

2. Geotechnical

Geotechnical exploration will be provided by Hart Crowser, Inc. and will be included in the Package B submittal. A preliminary geotechnical report was provided as part of the Request for Proposal document and included preliminary conclusions and recommendations for shallow foundation design and pavement recommendations.

Warriors in Transition Barracks Fort Lewis, Washington

Part 2 – Design Requirements and Provisions

A2. Civil Narrative

1. Civil Design Criteria

The following Design Criteria/Standards were used for the civil design:

- UFC 3-210-06A Site Planning and Design
- UFC 3-230-06A Drainage in Areas other than Airfield
- Low Impact Development Technical Guidance Manual of Puget Sound Storm Water Development
- Fort Lewis Master Plan Principles and UFC 4-010-01 Car Parking Design Standards
- NFPA 1, UFC 3-600-01 Fire Access Lane
- NFPA 13 and 24 Domestic and Fire Water

2. Existing Conditions

The project site is located adjacent to Madigan Army Medical Center (MAMC) in the southern portion of Fort Lewis, Washington. The project includes the proposed Warriors in Transition (WT) Barracks complex, the combined Company Headquarters/Battalion Headquarters (CO/BN HQ) and Soldier and Family Assistance Center (SFAC) site and the associated parking lots are located at the intersection of Jackson Avenue and Gardner Loop. Gardner Loop runs northwest to southeast and bisects the site, with the barracks site to the northeast and the West Privately Owned Vehicle (POV) parking lot to the southwest.

WT Barracks Complex: The WT Barracks complex and the associated ADA parking lot is located northeast of Gardner Loop and is bordered by an existing MAMC parking lot to the north, Fitzsimmons Avenue to the east, the HQ/SFAC Building to the south and Gardner Loop to the west. The proposed site is currently used as an existing parking lot to support the MAMC.

HQ/SFAC Building Site and south parking area: The HQ/SFAC building will be located just south of the WT Barracks complex and is bordered by Jackson Avenue to the south. The proposed site is currently used as an existing parking lot to support the MAMC.

Gardner Loop: The existing street is an undivided two lane asphalt road with gravel shoulders.

West POV Lot: This site is currently undeveloped and contains a mix of vegetated area and retention swales.

3. Demolition

Demolition at the project sites will include those items which allow for the construction of the proposed facilities. Items designated for demolition and their limits are as depicted on the plans and will essentially consist of removal of pavements, fencing, trees, topsoil and miscellaneous above ground structures. Various utility lines require rerouting such as water, gas and electrical lines. Storm drain lines, ditches and ponds will be removed as well. All removed utilities will be capped at the main. Underground piping abandoned in place will be filled with low strength grout and capped at the ends. Existing trees will be

Design Analysis (Package A)

Final Submittal

Civil Narrative

Warriors in Transition Barracks Fort Lewis, Washington

> preserved wherever possible and plans have incorporated comments from the Tree Preservation plan as applicable.

4. Site Layout

The site design and construction within the project limits of construction support the new WT Barracks and SFAC/BN HQ facilities. Supporting facilities include, but are not limited to, utilities, electric service, exterior and security lighting, fire protection and alarm systems, security barriers, water, gas, sewer and site improvement.

The site layout is consistent with the intent of the RFP. Some modifications are being proposed based on various criteria and input from the Fort Lewis Planning Department and as directed by the Army Corps of Engineers. Modifications include parking configuration, drive aisle alignment and layout, and fire lane adjustments. The proposed buildings incorporate the 82' (25m) standoff distance setback from parking or road surfaces, as well as the 33' (10m) unobstructed space setback.

Accessibility for individuals with disabilities is provided. Antiterrorism/Force Protection measures are also included in the facility design in accordance with applicable criteria.

The WT Barracks and SFAC/BN HQ facilities are located within close proximity to facilitate ease of access among the facilities. A covered walkway is provided between the main entrances of Building 2 and the SFAC/BN HQ Building to achieve connectivity.

5. Pavement

A commercial paving mix conforming to the requirements in the project specifications will be designated for asphalt and concrete paving.

For pavement design, the following traffic conditions are assumed for the design as included in the geotechnical report section of the RFP:

For the parking lot:

- ADT (projected average two-way daily traffic) = 1,000 passenger vehicles
- Analysis Period = 20 years
- 0.02 ESAL/Vehicle

For Gardner Loop, we are assuming the following:

- ADT (projected average two-way daily traffic) = To be determined by Fort Lewis
- Analysis Period = 20 years
- 0.02 ESAL/Vehicle

6. Grading, Drainage and Erosion Control

The grading and drainage design will comply with UFC 3-230-06A and the Low Impact Development Technical Guidance Manual of Puget Sound Storm Water Development. It also follows the guidelines of the Washington State Department of Ecology's Stormwater Management Manual for Western Washington (February 2005).

Design Analysis (Package A) Final Submittal

Civil Narrative

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Warriors in Transition Barracks Fort Lewis, Washington

The site is designed to retain stormwater runoff on-site through the use of infiltration ponds and trenches. The pond and trench locations are spread throughout the site to capture the rainwater runoff close to the source. The infiltration ponds and trenches have an average side slope of 5:1 with a maximum of 3:1 in a few locations.

Roof drainage generally sheet flows towards the infiltration pond or trenches with the exception of the roof drainage from the courtyard which are piped through underground HDPE stormwater pipes which outfall into retention/infiltration ponds.

Infiltration ponds that receive stormwater runoff from paved parking areas or the roadway are designed to treat the runoff using vegetation and a soils layer to act as a filtering medium.

The SFAC/BN HQ building pad will be graded to slab subgrade elevation under this project.

7. Utilities

Certain existing utilities will require re-routing to allow for the proposed buildings. These include a 16" water line serving the MAMC, 10" cooling well line and associated electrical line serving the MAMC cooling system, and a 12" grey water line located under the existing swale at the northeast section of the project. An existing natural gas line which runs across the existing parking lot will also require re-routing to accommodate the proposed barrack buildings.

Domestic and Fire Water Service

The domestic and fire water service are combined systems with separate branches to each building. Based on the fire flow information, no booster system is necessary. There will be two points of connection to serve the site domestic and fire water needs. Each of the domestic water systems will be metered and protected with a backflow prevention inside each of the buildings. Piping system will be PVC, with DI fittings. Metallic fittings will be wrapped for corrosion protection.

Irrigation Water Service

The irrigation water service for each site will branch off the site water system and will include an irrigation meter and backflow preventer. Irrigation will be provided at new plantings areas around buildings and landscaped courtyard areas.

Gas Service

Gas service will be provided to meters adjacent to the mechanical room of each barracks building. Project includes contract and coordination with Puget Sound Energy for the installation of the natural gas piping up to and including the meter to all facilities. The meter will be provided with equipment to connect to the DDC/BAS/UMCS system for monitoring.

Sanitary Sewer Service

The sanitary sewer systems will be gravity systems using PVC pipe and precast manholes, with one to two building connections per building mainly near the eastern half of each of the buildings. The sanitary system will discharge to an existing manhole near MAMC at the northeast corner of the site.

Design Analysis (Package A)

Final Submittal

Civil Narrative

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Warriors in Transition Barracks Fort Lewis, Washington

8. Utilities for SFAC/BN HQ

Utility services will be provided for the future SFAC/BN HQ Building under this project, as follows:

- Sanitary, domestic water and fire water will be stubbed to within 5 feet of building, adjacent to the mechanical room.
- Storm drainage connection points for roof drainage, at locations indicated on drawings.
- Gas service will be provided to the meter location. Final coordination of meter installation with PSE will be responsibility of the SFAC/BN HQ Contractor.

Design Analysis (Package A)	Final Submittal	Civil Narrative

Part 2 – Design Requirements and Provisions

A3. **Architectural Narrative**

1. Architectural Design Criteria

The following Design Criteria/Standards were used for the architectural design:

- Fort Lewis Installation Design Guide
- UFC 1-200-01 (IBC 2006) General Building Requirements
- UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings

2. Project Description

The design of the WT Barracks will meet established installation design standards and will complement the existing character of the surrounding area. Building material selection will emphasize durability over style. Building form and massing will be developed in accordance with the specific building functions. Sustainable design strategies will be incorporated into the design and construction of the project to maximize energy and resource conservation and minimize life cycle costs for long term maintenance of the facility.

Construction materials and finishes should be durable and capable of withstanding troop usage. Proposed building materials will have a minimum expected useful life of 25 years. Finishes shall present an attractive and professional appearance to the building exterior and interior spaces. Because the space is expected to last for an extended period of time, a classic and timeless look is preferred over following stylistic trends.

3. Basic Criteria

The WT Barracks have been identified as Group R-2 occupancy with a Type V-A noncombustible construction. They are considered to be a 'permanent' category of construction. The buildings are protected throughout by an approved automatic sprinkler system.

The following Industry criteria are applied to the design of the project:

- ICC (IBC) International Building Code; 2006
- ICC (IECC) International Energy Conservation Code; 2006
- ICC (IFGC) International Fuel Gas Code; 2006
- ICC (IMC) International Mechanical Code; 2006
- NFPA 101 Life Safety Code

4. Architectural Massing, Size and Configuration

The proposed building aesthetic will fit well in the proposed site and the surrounding urban environment and with the expressed architectural theme.

Architectural elements will be coordinated to achieve a unified façade, expressive of the desired Neo-Georgian architectural style. To achieve balance, the buildings have been laid out to be symmetrical along

Design Analysis (Package A) Final Submittal

Architectural Narrative

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Warriors in Transition Barracks Fort Lewis, Washington

the north-south axis, anchored by two distinctive north and south facing entrances that draw attention to the main points of entry to the building.

Windows are arranged in a syncopated rhythm to be complementary to the Neo-Georgian architectural theme. Design of other systems elements will be taken into consideration as part of the overall building design. For example, outside air intake to the roof attic mechanical units will be accommodated via use of circular shaped louvers that can be treated as accent details. They will be coordinated to provide a visually attractive structure that is also complementary to the Neo-Georgian theme.

A steep, 5:12 slope is incorporated with the standing seam metal roofing system to create the necessary height to develop a proportionate building mass. Use of different roof elements such as gabled or semi-circular dormers and hipped ends helps create varying visual points of interest in the façade.

5. Construction Materials and Finishes

Exterior finish materials are selected for durability, economy, availability, constructability and compatibility with existing architecture in the vicinity. The WT Barracks will have standing seam metal roofing, smooth finished stucco, ground and split face CMU and brick veneer finishes. A varied-height masonry base will be provided covering a minimum of 65% of the exterior wall area excluding glazing.

The buildings have permanent signage attached to at least two faces of the building indicating the assigned building number or address. The signage locations and details confirm to the Installation Design Guide.

6. Exterior Walls

The WT Barracks buildings are steel-framed structures with steel stud exterior bearing wall construction. The exterior wall is composed of masonry, brick or split faced CMU veneer and stucco, with rigid insulation, a layer of sheathing, infiltration barrier, 6" metal studs filled with R-19 batt insulation, and 5/8" gypsum board. Other exterior finishes include tinted glass windows with anodized aluminum frames.

7. Roof System

A standing seam metal roof system (SSMR) with pre-finished gutters and downspouts will be provided for the WT Barracks buildings.

8. Exterior Doors and Frames

Anodized aluminum stile and rail doors will be provided at the main building entrances doors. All exterior glazed door openings meet DoD Minimum Antiterrorism Standards for Buildings, UFC 4-010-01. Door glazing is clear laminate glass. Insulated, painted hollow metal doors and frames will be used at exterior secondary entrances.

9. Exterior Windows

The clear anodized aluminum window frames will be designed and anchored to meet Minimum Antiterrorism Standards for Buildings, UFC 4-010-01 requirements. Exterior windows at the sleeping and living rooms will be of single hung type with an insect screen.

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Final Submittal

Architectural Narrative

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Warriors in Transition Barracks Fort Lewis, Washington

As discussed with USACE and DPW, in lieu of sunscreens and light shelves, increased size windows and glazing with Low-E coatings and improved solar heat gain coefficients will be provided.

10. Architectural Louvers

Architectural louvers are fixed extruded-aluminum, continuous horizontal drainable blade, and vertical sight proof louvers with bird screen and insulated blank-off panels. Intake louvers are a minimum of ten feet above grade and have security mesh applied. Louver sizes are based on 50% free area.

11. Interior Walls and Partitions

Interior partitions for the facility will, at a minim, be constructed of metal studs with 5/8" gypsum wall board finish on each side. Some partitions will have multiple layers of gypsum board with acoustical batt insulation to meet the required STC (Sound Transmission Coefficient) ratings. All partitions will be extended to the underside of the floor above or building roof structure. Fire rated partitions will be provided where required.

12. Interior Doors and Frames

Interior doors will be insulated hollow metal with hollow metal frames. Doors will be fire rated as required when located in a fire rated wall or partition. All interior doors will meet a minimum rating of STC 25 as required by RFP, except sleeping room doors, which will meet a minimum rating of STC 32.

13. Builders' Hardware

The facility is master keyed to the existing Post Master key system. All exterior doors have locksets, closers, exit devices as required, weather-stripping, rain drips, and thresholds. Typical locksets and latchsets are full mortise with levers. All hinges are ball bearing type with number of hinges as required for size of door. Hardware color is brushed stainless steel or brushed chrome depending on location.

A programmable electronic key card access system will be provided on all exterior entry doors, apartment unit doors and bedroom doors. The key card access system will provide a single key care for the individual soldier, programmable to open all exterior entry doors, the soldier's apartment unit door, and the soldier's bedroom door.

14. Antiterrorism/Force Protection (ATFP)

See Appendix 9 for Antiterrorism/Force Protection (ATFP) Considerations.

Design Analysis (Package A)

Final Submittal

Architectural Narrative

Warriors in Transition Barracks Fort Lewis, Washington

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A4. Comprehensive Interior Design Narrative (to be included in Package C-1 submittal)

Design Analysis (Package A)

Final Submittal

Interior Design Narrative

Warriors in Transition Barracks Fort Lewis, Washington

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Part 2 – Design Requirements and Provisions

A5. Structural Narrative (to be included in Package B submittal)

Design Analysis (Package A)

Final Submittal

Structural Narrative

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Warriors in Transition Barracks Fort Lewis, Washington

Part 2 – Design Requirements and Provisions

A6. **Underground Plumbing Narrative**

1. Site Plumbing System

Below grade soil-waste piping will be Schedule 40 PVC, routed to sanitary sewer connection points as indicated on drawings.

Cleanouts will be provided at appropriate locations.

Refer to Appendix 4 for sizing calculations.

Final Submittal

Site Mechanical Narrative

Warriors in Transition Barracks Fort Lewis, Washington

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Part 2 - [)esian	Requirements	and	Provisions
------------	--------	--------------	-----	-------------------

A7. Mechanical and Plumbing Narrative (to be included in Package C-1 submittal)

Design Analysis (Package A)

Final Submittal

Mechanical and Plumbing Narrative

Warriors in Transition Barracks Fort Lewis, Washington

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A8. **Fire Protection Narrative** (to be included in Package C-1 submittal)

Design Analysis (Package A)

Final Submittal

Fire Protection Narrative

Warriors in Transition Barracks Fort Lewis, Washington

Part 2 – Design Requirements and Provisions

A9. Site Electrical and Outside Plant Communications Narrative

Medium Voltage Distribution System

The primary power point of connection will be made to the existing 13.8KV circuit located in a manhole south of Jackson Avenue near Gardner Loop road intersection. A new 15KV distribution system will originate from this point and be distributed to the new complex. See Appendix 10, Electrical Design Calculations, for additional information.

A new pad-mounted, dead-front, 6-way switch will be installed near the intersection of Gardner Loop and Jackson Avenue to serve both WT Barracks buildings and the future SFAC/BN HQ as well as to provide switched ways for additional future facilities. The switch will contain one incoming compartment for radial feeds consisting of a 600 amp load interrupter switch. The outgoing compartments will provide fused disconnects with 200 amp load-break terminations operated by a hook-stick.

Site Liahtina

Existing electrical lines serving the existing POV parking lighting will be removed. The existing POV lighting feeders are proposed to be re-routed to provide electrical service for the new west POV parking area lighting. Other site lighting (Handicapped POV Lot, Gardner Loop, and walkway lighting) will be fed from the new barracks buildings.

Exterior lighting appropriate for building functions, street lighting mounted on steel metal poles, parking lot lighting, and pedestrian pathway lighting conforming to IESNA recommended illumination levels and Washington State Non-Residential Energy Code will be provided with photoelectric control with manual bypass. Exterior fixtures at the West POV parking lot will be high-efficiency solid state LED luminaires with a Type V distribution, mounted on 30 foot poles. Exterior fixtures for roadways will also employ solid state LED luminaires with appropriate distribution types of 30 foot poles. Walkways will be illuminated primarily with solid state LED luminaires on 15 foot poles, with some LED bollard type fixtures used for augmentation. Lights at the exterior sport courts will be 400 watt metal halide type on 30 foot poles, controlled with a local timer switch.

Telecommunications Service

The communications services for the project will originate at existing Manhole MA-000075 for copper cabling and at Building 9040 TEF for fiber cabling. 1200 pair copper and 3C strand SMOF will be routed from these locations via existing ductbank to existing Manhole MA-000155. From MA-000155, new 4-way ductbank and manholes will be provided to distribute 50 pair copper and 12 strand SMOF to each of the barracks buildings and 200 pair copper and 24 strand SMOF to the SFAC/BN HQ.

The extra 4" ducts will be available for Qwest and Comcast services as well as future/spares.

SFAC/BN HQ Building

Primary power and outside plant communications system for the SFAC/BN HQ Building will be provided under this project, as follows:

 Primary power – transformer vault provided at 33' from building. MV cables will be provided from the new 6-way switch to the transformer vault. Transformer and termination of MV cables at each end will be by the SFAC/BN HQ Contractor.

Design Analysis (Package A) Final Submittal

Site Electrical & Outside Plant Communications Narrative

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Warriors in Transition Barracks Fort Lewis, Washington

- Secondary power empty ductbank from the transformer vault to within 5' of the building will be provided.
- Communications ductbank from existing MH MA-000155 to within 5' of the building will be provided. 200 pair copper and 24 strand SMOF with sufficient slack in MH MA-000155 will be provided to allow for extension into the building and splicing at both ends by the SFAC/BN HQ Contractor.

Warriors in Transition Barracks Fort Lewis, Washington

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A10. Electrical and Communications Narrative (to be included in Package C-1 submittal)

Design Analysis (Package A) Final Submittal

Warriors in Transition Barracks Fort Lewis, Washington

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Part 2 – Design Requirements and Provisions

A11. Landscaping (to be included in Package C-1 submittal)

Warriors in Transition Barracks Fort Lewis, Washington

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Part 2 – Design Requirements and Provisions

A12. LEED/Sustainability Narrative (to be included in Package C-1 submittal)

Warriors in Transition Barracks

Fort Lewis, Washington

Section: Appendix II

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APPENDICES

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Warriors in Transition Barracks Fort Lewis, Washington

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Warriors in Transition Barracks Fort Lewis, Washington

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Warriors in Transition Barracks Fort Lewis, Washington

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APPENDIX 2 SQUARE FOOTAGE ANALYSIS

(To Be Included in Package C-1 Submittal)

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APPENDIX 3
CODE REVIEW SUMMARY

(To Be Included in Package C-1 Submittal)

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Warriors in Transition Barracks Fort Lewis, Washington

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APPENDIX 4 CIVIL DESIGN CALCULATIONS

Drainage Report

Sanitary Sewer Calculations

Water Calculations

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DRAINAGE REPORT

US ARMY CORPS OF ENGINEERS

SEATTLE DISTRICT

Warriors in Transition Barracks Fort Lewis, Washington

November 25, 2009

Prepared by: Erik Wahrgren, Reviewed by: Robert Bonney, P.E., Rosa Chen, P.E.

TranSystems: 1845 N.E. Couch, Portland, OR 97232

Tel: (503) 232-2117, (503) 546-5684

Tuesday, October 26, 2010

Certification and Statement:

I hereby certify that this Drainage Report for the US Army Corps of Engineers *Warriors in Transition Barracks* has been prepared by me or under my supervision and meets minimum standards of the US Army Corp of Engineers and normal standards of engineering practices. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.



REVISION	<u>BY</u>	<u>DATE</u>	<u>COMMENTS</u>

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Inserts:

- Vicinity Map
- Site Plan
- ESCP

Appendix B

Stormwater Drainage Narrative

Appendix C

HydroCAD drainage calculation summaries and hydrographs

Appendix D

Tuesday, October 26, 2010

Geotechnical report

Appendix E

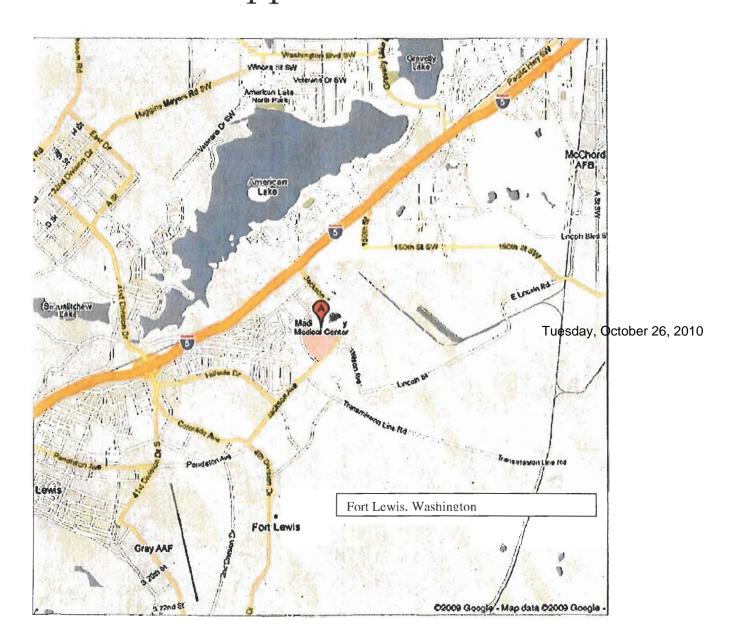
Operations and Maintenance Plan

Appendix F

Record of Survey with Legal Description

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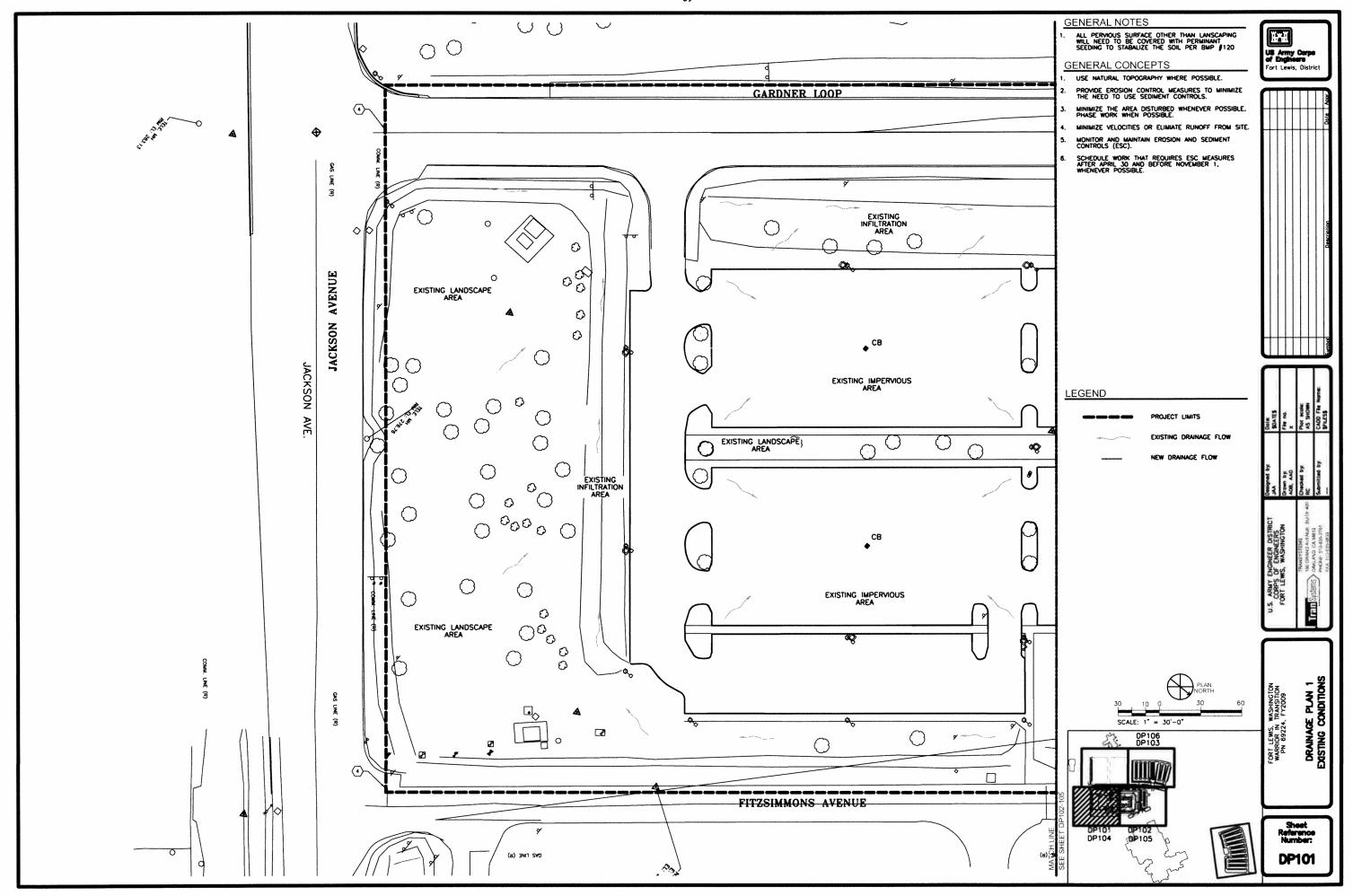
Appendix A

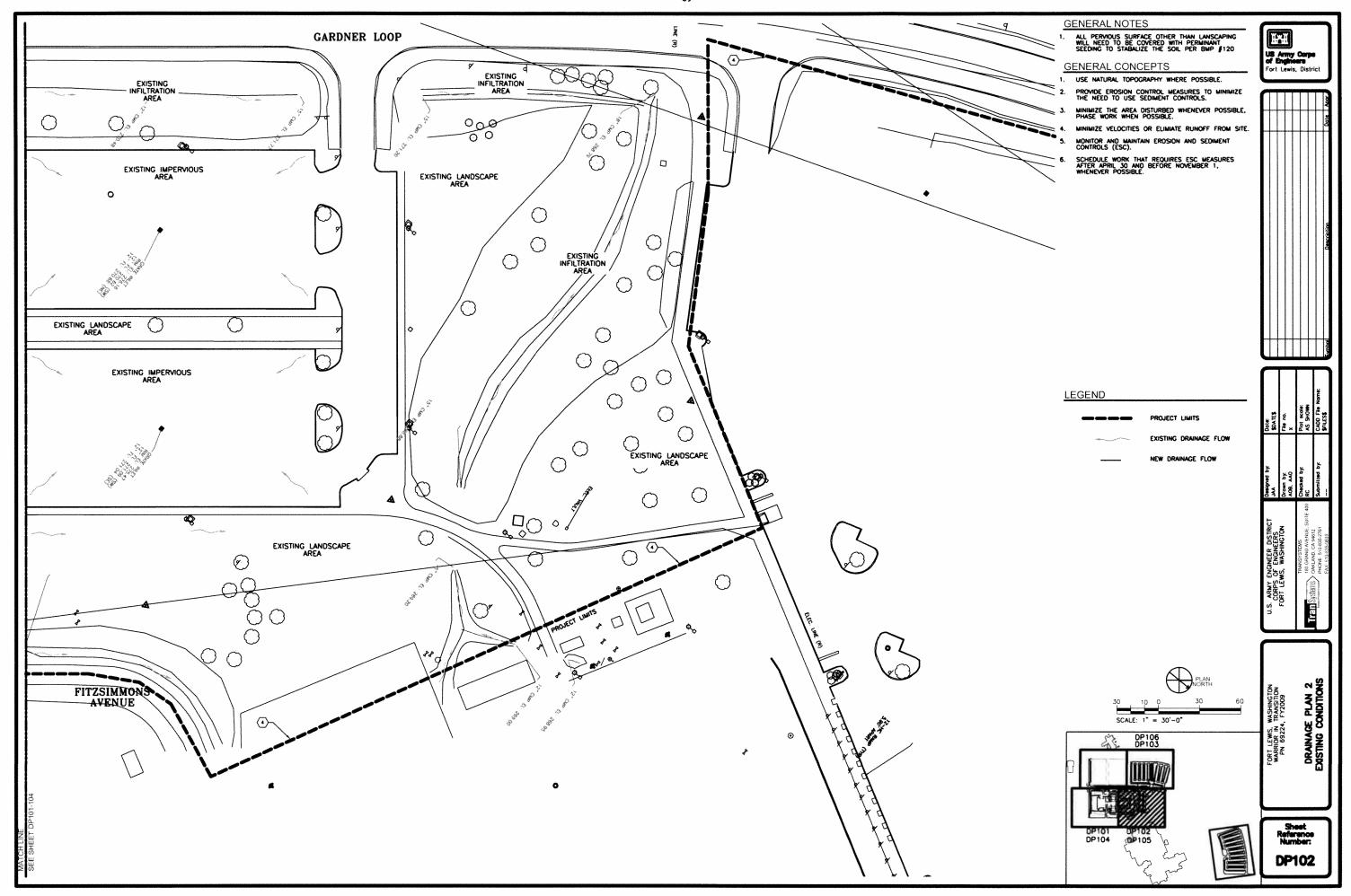


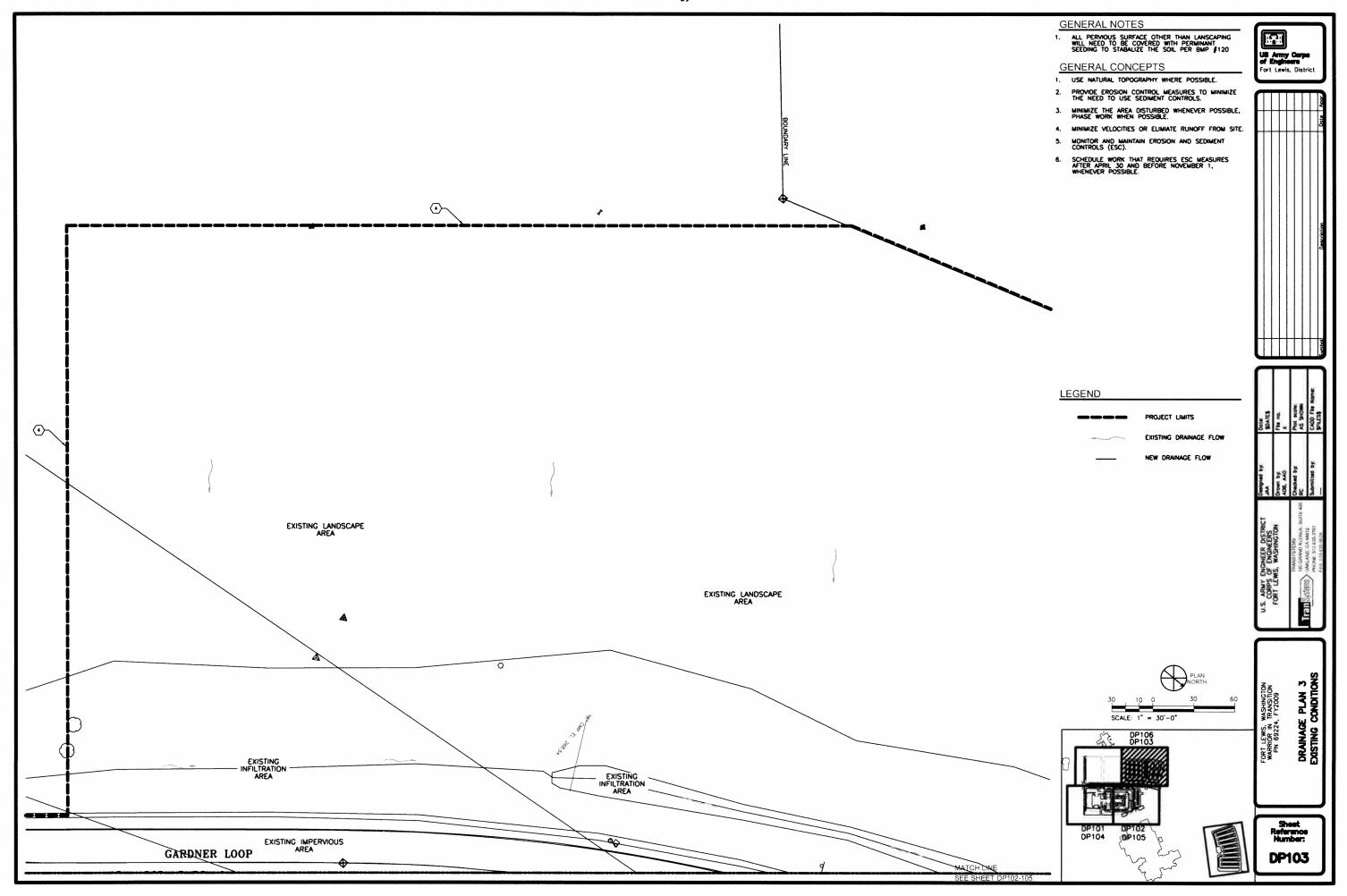
Vicinity Map

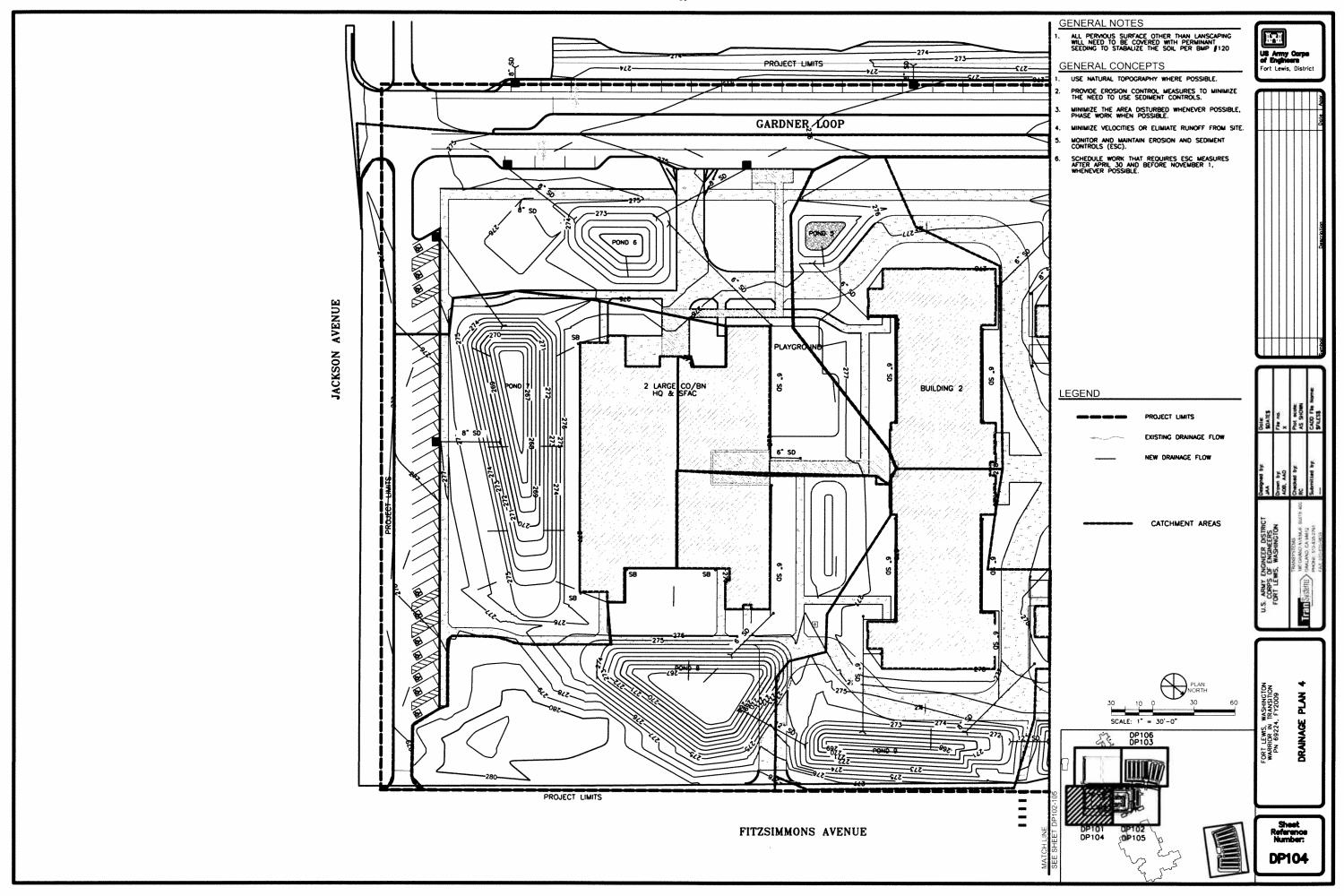


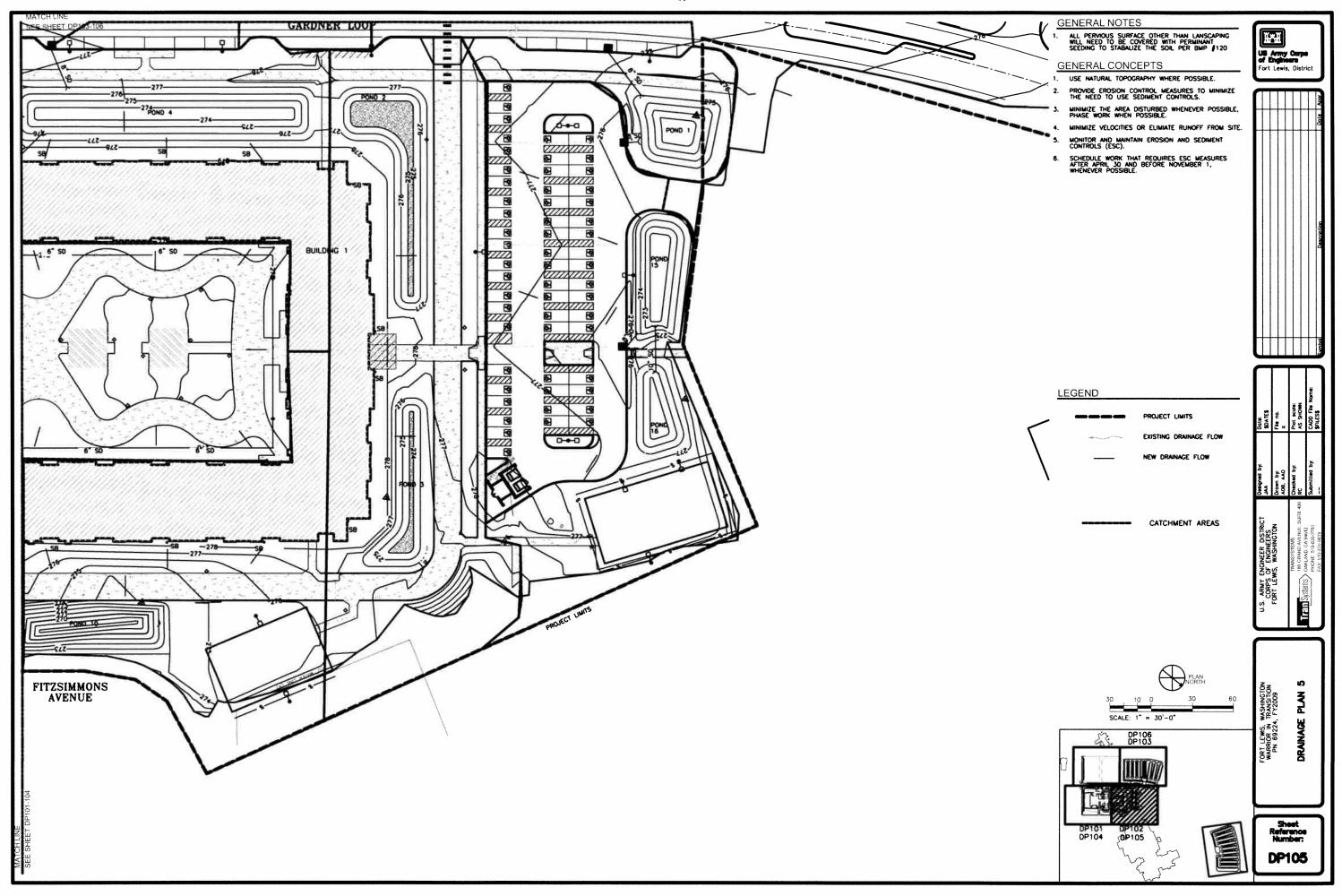
Aerial Map

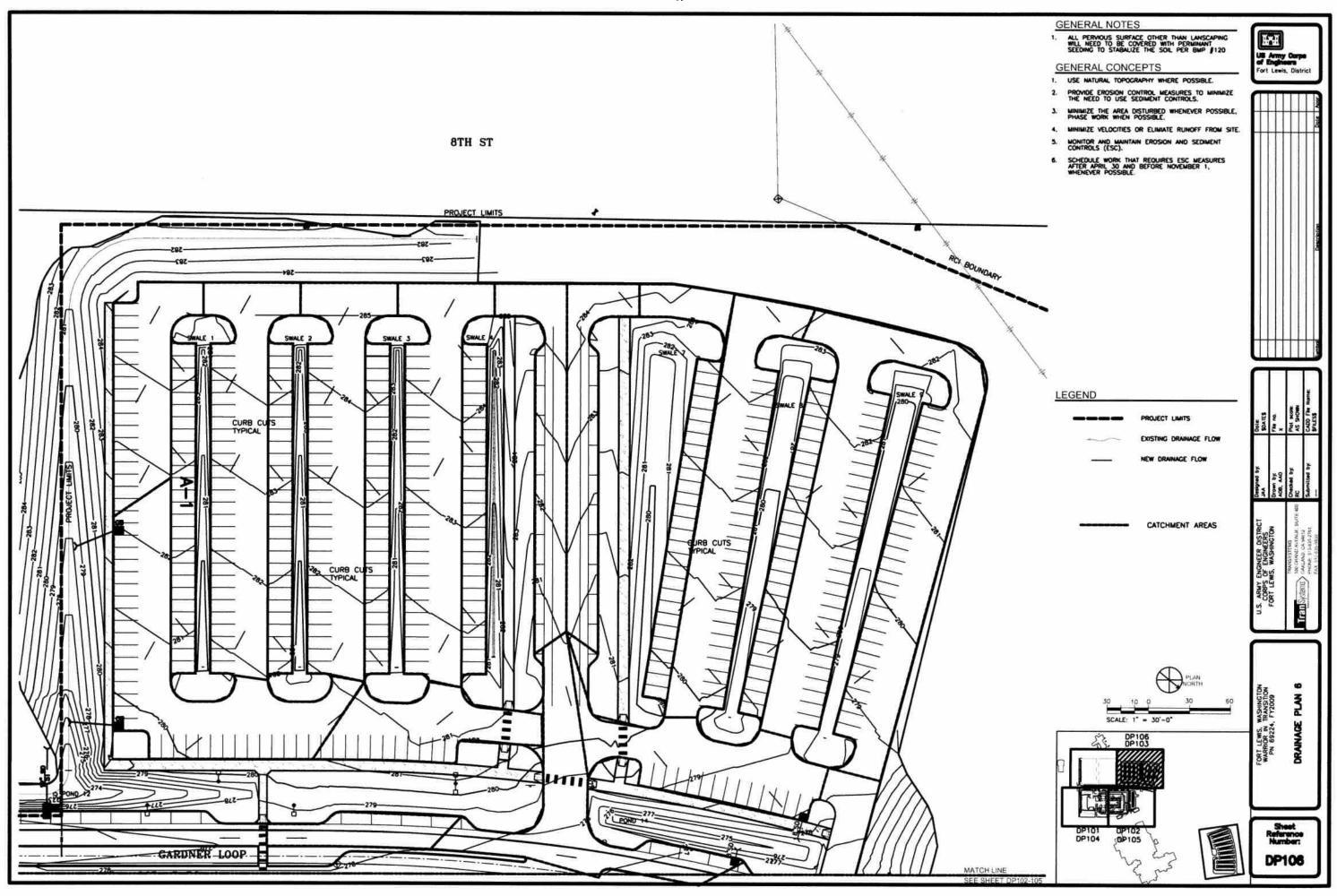












Appendix B

Stormwater Drainage Narrative:

Existing conditions:

The subject property of 15 acres consists of 174,240 S.F. of impervious pavement surfaces and 479,160 S.F. of the remainder of the site consists of bare ground and vegetation such as native grasses, shrubs and trees. The stormwater runoff from all impervious surfaces drains to existing catch basins and discharge into infiltration ponds, which ultimately infiltrates into the ground. The geotechnical report identifies the in-situ soils as being Vashon Drift, mainly composed of recessional and proglacial stratified outwash sand and gravel. In general, soils encountered on the borings consisted of medium dense to very dense, recessional outwash sand and gravel with trace to some silt. Groundwater was not observed in borings exceeding 15 feet in depth .

Tuesday, October 26, 2010

Proposed conditions:

The site improvements consist of 82,870 S.F. of total roof area and 285,579 S.F. of new impervious pavement surfaces that require stormwater management. The remainder of the site will be landscaped with shrubs and native grasses to help control erosion from stormwater runoff. All existing catch basins will be removed and a new stormwater collection system will be constructed. Stormwater runoff from all new impervious surfaces will drain into catch basins and through curb cuts. All runoff will be diverted into infiltration ponds and trenches. The stormwater will ultimately infiltrate into the ground. The retention facility was designed with an infiltration rate of 10 inches per hour for roof runoff ponds and 2 inches per hour for treatment ponds and trenches. The landscaped areas will infiltrate rainfall into the ground. No stormwater runoff will discharge from the site.

There will not be any stormwater runoff discharging from the site that will warrant special consideration for the stormwater management design. See the HydroCAD drainage calculation summaries and hydrographs located in Appendix C and the geotechnical report located in Appendix D.

Analysis

The stormwater drainage calculations are based on the SCS Method, Type IA 24-hour storm with a minimum time of concentration of 5 minutes. The CN value for impervious surfaces is 98. The 6 month 24 hour water quality storm event is assumed to be 1.21 inches. The 2-year, 24-hour storm event is assumed to be 1.61 inches, and the 100-year, 24-hour storm event is assumed to be 4.10 inches.

Stormwater runoff from all new impervious surfaces will drain into catch basins. Roof runoff will be collected from downspouts and conveyed to infiltration ponds. All runoff will be diverted into infiltration ponds and stormwater will ultimately infiltrate into the ground.

The initial condition for the pond facility is empty at the start of a storm event and has a free board of 1.00 foot for the 100-year, 24-hour storm event.

A riprap outfall structure will be constructed at the catch basin pipe outfalls to prevent erosion of the infiltration ponds.

There are no known natural geological formations that form underground aquifers or springs.

Tuesday, October 26, 2010

Summary

100yr.-24hr. rainfall =4.10"

Pond I (treatment) Volume=4204 cf Peak Elev.=273.77' Flood Elev.=275.00'

Pond 2(non-treatment) Volume=6808 cf Peak Elev.=275.01' Flood Elev.=277.00'

Pond 3(non-treatment) Volume=3733 cf Peak Elev.=274.21' Flood Elev.=276.00'

Pond 4(treatment) Volume=14958 cf Peak Elev.=274.95' Flood Elev.=277.00'

Pond 5(non-treatment) Volume=2208 cf Peak Elev.=274.98' Flood Elev.=276.00'

Pond 6(treatment) Volume=7164 cf Peak Elev.=272.52' Flood Elev.=274.00' Pond 7(treatment) Volume=47736 cf Peak Elev.=267.98' Flood Elev.=275.00'

Pond 8(treatment) Volume=41636 cf Peak Elev.=268.88' Flood Elev.=275.00'

Pond 9(treatment) Volume=23629cf Peak Elev.=273.27' Flood Elev.=275.00

Pond 10(treatment) Volume=19437cf Peak Elev.=273.66' Flood Elev.=275.00'

Pond 12(treatment) Volume=55419cf Peak Elev.=273.41' Flood Elev.=278.00'

Pond 14(treatment) Volume=3581cf Peak Elev.=275.61' Flood Elev.=277.00'

Pond 15(treatment) Volume=7660 cf Peak Elev.=273.45 Flood Elev.=275.00

Infiltration Swale 1,2 Volume=2878 cf Peak Elev.=280.20 Flood Elev.=282.00

Infiltration Swale 3,4 Volume=2878 cf Peak Elev.=280.20 Flood Elev.=282.00

Swale 7 Volume=3019 cf Peak Elev.=280.06 Flood Elev.=282.00

Swale 8 Volume=2878 cf Peak Elev.=279.27' Flood Elev.=281.00

Swale 9 Volume=6513 cf Peak Elev.=279.63' Flood Elev.=281.00' Tuesday, October 26, 2010

Appendix C

HydroCAD drainage calculation summaries and hydrographs

Tuesday, October 26, 2010

WT Ft. Lewis Developed Site-2009-11-25

Type IA 24-hr 100yr-24hr Rainfall=4.10"

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Summary for Pond P1: Infiltration Pond

Inflow Area = 0.404 ac,100.00% Impervious, Inflow Depth > 3.07" for 100yr-24hr event

Inflow = 0.40 cfs @ 7.86 hrs, Volume= 0.103 af

Outflow = 0.07 cfs @ 11.28 hrs, Volume= 0.075 af, Atten= 82%, Lag= 205.5 min

Primary = 0.07 cfs @ 11.28 hrs, Volume= 0.075 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 1.77'@ 11.28 hrs Surf.Area= 1,523 sf Storage= 1,665 cf

Flood Elev= 3.00' Surf.Area= 2,635 sf Storage= 4,204 cf

Plug-Flow detention time=269.5 min calculated for 0.075 af (72% of inflow)

Center-of-Mass det. time=141.2 min (786.6 - 645.4)

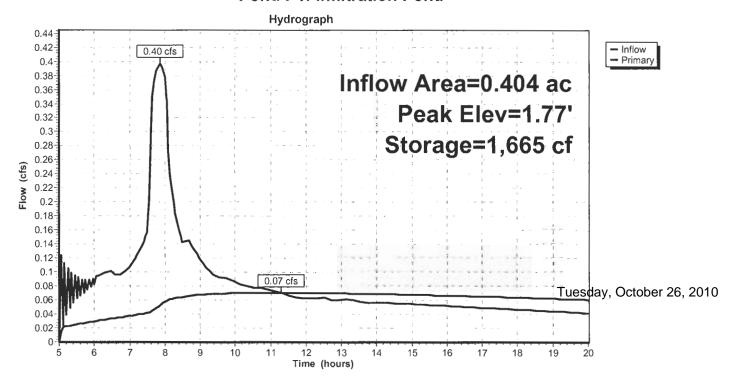
Volume	Invert	Avail.Sto	rage Storage	e Description	
#1	0.00'	4,20	04 cf Custor	n Stage Data (Prismatic)Listed	below (Recalc)
Elevatior (feet		urf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.00)	440	0	0	·
1.00)	976	708	708	
2.00)	1,690	1,333	2,041	
3.00)	2,635	2,163	4,204	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	0.00'	2.000 in/hr	Exfiltration over Surface area	

Primary OutFlow Max=0.07 cfs @ 11.28 hrs HW=1.77' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.07 cfs)

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Pond P1: Infiltration Pond



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Summary for Pond P2: Infiltration Pond

Inflow Area = 0.532 ac, 42.06% Impervious, Inflow Depth > 1.30" for 100yr-24hr event

Inflow = 0.22 cfs @ 7.87 hrs, Volume= 0.058 af

Outflow = 0.22 cfs @ 7.90 hrs, Volume= 0.058 af, Atten= 0%, Lag= 1.4 min

Primary = 0.22 cfs @ 7.90 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.01'@ 7.90 hrs Surf.Area= 1,515 sf Storage= 19 cf

Flood Elev= 2.00' Surf.Area= 5,369 sf Storage= 6,808 cf

Plug-Flow detention time=1.8 min calculated for 0.057 af (100% of inflow)

Center-of-Mass det. time=0.9 min (651.3 - 650.4)

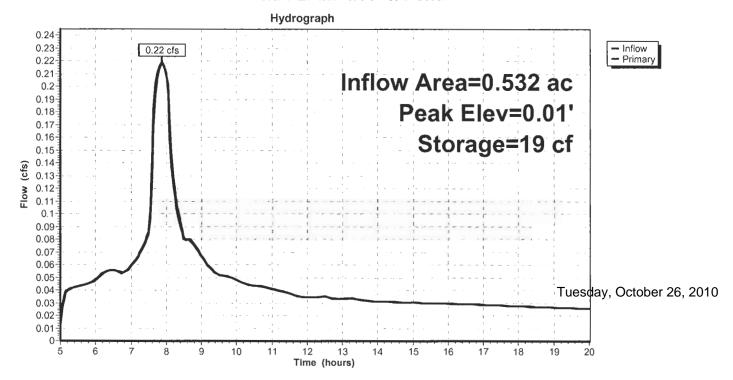
Volume	Invert	Avail.Sto	rage Storage	e Description		
#1	0.00'	6,80	08 cf Custor	n Stage Data (Pr	rismatic)_isted below	w (Recalc)
Elevation (feet)	Surf./	Area sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		Tuesday, October 26, 2010
0.00	1	,492	0	0		
1.00	3	,377	2,435	2,435		
2.00	5	,369	4,373	6,808		
Device Ro	uting	Invert	Outlet Devic	es		
#1 Prir	mary	0.00'	10.000 in/hr	Exfiltration ove	r Surface area	

Primary OutFlow Max=0.35 cfs @ 7.90 hrs HW=0.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.35 cfs)

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Pond P2: Infiltration Pond



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Summary for Pond P3: Infiltation Pond

Inflow Area = 0.532 ac, 42.06% Impervious, Inflow Depth > 1.30" for 100yr-24hr event

Inflow = 0.22 cfs @ 7.87 hrs, Volume= 0.058 af

Outflow = 0.16 cfs @ 8.10 hrs, Volume= 0.058 af, Atten= 25%, Lag= 13.6 min

Primary = 0.16 cfs @ 8.10 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.21' @ 8.10 hrs Surf.Area= 711 sf Storage= 119 cf

Flood Elev= 2.00' Surf.Area= 3,595 sf Storage= 3,733 cf

Plug-Flow detention time=3.4 min calculated for 0.058 af (100% of inflow)

Center-of-Mass det. time=2.6 min (652.8 - 650.3)

Volume	Invert	Avail.Sto	rage Storage	Description	
#1	0.00'	3,73	33 cf Custom	Stage Data (Prismatio	c)Listed below (Recalc)
Elevation (feet)		.Area sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.00		453 1,709	0 1,081	0 1,081	,
2.00		3,595	2,652	3,733	
Device Ro	uting	Invert	Outlet Device	es	
#1 Prir	mary	0.00'	10.000 in/hr	Exfiltration over Surfa	ce area

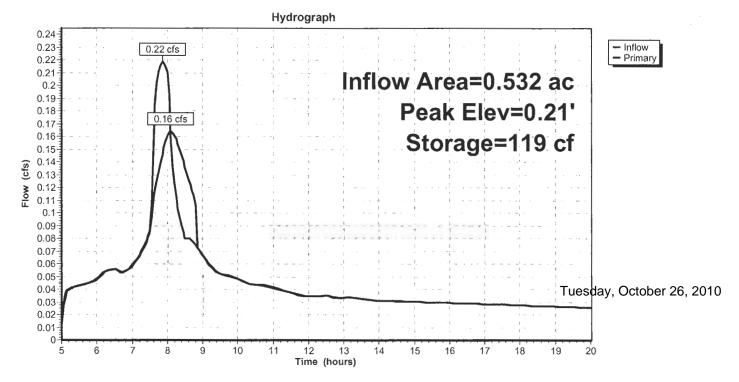
Primary OutFlow Max=0.16 cfs @ 8.10 hrs HW=0.21' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.16 cfs)

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Pond P3: Infiltation Pond



WT Ft. Lewis Developed Site-2009-11-25

Type IA 24-hr 100yr-24hr Rainfall=4.10"

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Summary for Pond P4: Infiltation Pond

Inflow Area = 1.010 ac, 78.25% Impervious, Inflow Depth > 2.40" for 100yr-24hr event

Inflow = 0.77 cfs @ 7.87 hrs, Volume= 0.202 af

Outflow = 0.17 cfs @ 9.98 hrs, Volume= 0.177 af, Atten= 78%, Lag= 126.4 min

Primary = 0.17 cfs @ 9.98 hrs, Volume= 0.177 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.95' @ 9.98 hrs Surf.Area= 3,683 sf Storage= 2,551 cf

Flood Elev= 3.00' Surf.Area= 8,499 sf Storage= 14,958 cf

Plug-Flow detention time=180.7 min calculated for 0.177 af (88% of inflow)

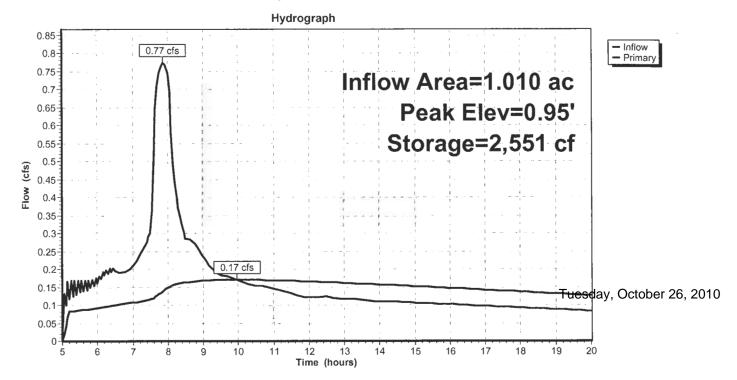
Center-of-Mass det. time= 117.2 min (764.5 - 647.3)

Volume		Invert	Avail.Sto	rage S	torage I	Description	
#1		0.00'	14,9	58 cf C	ustom	Stage Data (Prismati	c)Listed below (Recalc)
Elevation (fee		Sur	f.Area (sq-ft)	Inc.S (cubic-f		Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.0	00		1,708		0	0	·
1.0	00		3,795	2,	752	2,752	
2.0	00		6,059	4,	927	7,679	
3.0	00		8,499	7,	279	14,958	
Device	Routi	ng	Invert	Outlet	Devices	3	
#1	Prima	arv	0.00'	2.000	in/hr Ex	filtration over Surfac	e area

Primary OutFlow Max=0.17 cfs @ 9.98 hrs HW=0.95' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.17 cfs)

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Pond P4: Infiltation Pond



WT Ft. Lewis Developed Site-2009-11-25

Type IA 24-hr 100yr-24hr Rainfall=4.10" Printed 11/25/2009

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Summary for Pond P5: Infiltration Pond

Inflow Area = 0.878 ac, 59.08% Impervious, Inflow Depth > 1.82" for 100yr-24hr event

Inflow = 0.51 cfs @ 7.87 hrs, Volume= 0.133 af

Outflow = 0.23 cfs @ 8.32 hrs, Volume= 0.133 af, Atten= 54%, Lag= 27.3 min

Primary = 0.23 cfs @ 8.32 hrs. Volume = 0.133 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 0.98' @ 8.32 hrs Surf.Area= 1,005 sf Storage= 714 cf

Flood Elev= 3.00' Surf.Area= 1,926 sf Storage= 2,208 cf

Plug-Flow detention time=19.0 min calculated for 0.133 af (99% of inflow)

Center-of-Mass det. time= 17.7 min (665.5 - 647.9)

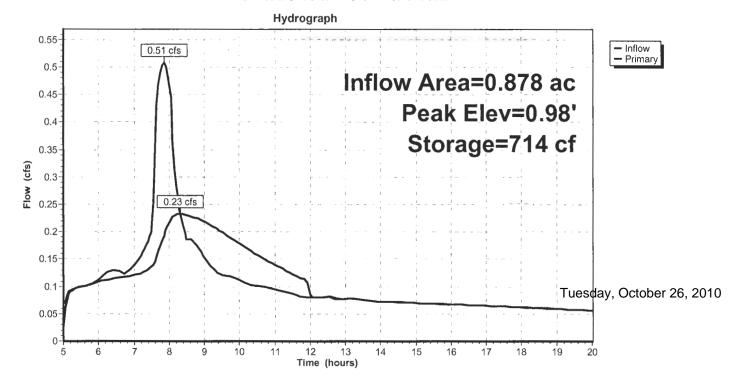
Volume	Inver	t Avail.S	Storage	Storage	Description			
#1	0.00)' 2	2,208 cf	Custom	Stage Data (Pr	rismatic)_isted be	elow (Recalc)	
Elevation (feet)	S	Surf.Area (sq-ft)		.Store c-feet)	Cum.Store (cubic-feet)		Tuesday, October 26, 20 ^o	10
0.00		456		0	0		,	
1.00		1,017		737	737			
2.00		1,926		1,472	2,208			
Device R	outing	Inve	ert Outl	et Device	s			
#1 P	rimary	0.0	00' 10.0	00 in/hr l	Exfiltration ove	r Surface area		

Primary OutFlow Max=0.23 cfs @ 8.32 hrs HW=0.98' (Free Discharge)
—1=Exfiltration (Exfiltration Controls 0.23 cfs)

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Pond P5: Infiltration Pond



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Summary for Pond 6P: Infiltation Pond

0.916 ac, 69.54% Impervious, Inflow Depth > 2.14" for 100yr-24hr event Inflow Area =

Inflow = 0.163 af

0.62 cfs @ 7.88 hrs, Volume= 0.10 cfs @ 12.63 hrs, Volume= Outflow = 0.104 af, Atten= 84%, Lag= 285.1 min

0.10 cfs @ 12.63 hrs, Volume= 0.104 af Primary =

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 2.52' @ 12.63 hrs Surf.Area= 2,111 sf Storage= 2,948 cf

Flood Elev= 4.00' Surf.Area= 3,690 sf Storage= 7,164 cf

Plug-Flow detention time=311.0 min calculated for 0.104 af (63% of inflow)

Center-of-Mass det. time= 151.6 min (799.7 - 648.0)

Volume	Inv	vert Ava	il.Storage	Storage	Description	
#1	0	.00'	7,164 cf	Custom	Stage Data (Prismatic)_iste	ed below (Recalc)
Elevatio		Surf.Area (sq-ft)		c.Store pic-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.0	00	389 942		0 666	0 666	,
2.0 3.0 4.0	00	1,653 2,529 3,690		1,298 2,091 3,110	1,963 4,054 7,164	
Device #1	Routing			tlet Device	s xfiltration over Surface are	ea

Primary OutFlow Max=0.10 cfs @ 12.63 hrs HW=2.52' (Free Discharge)

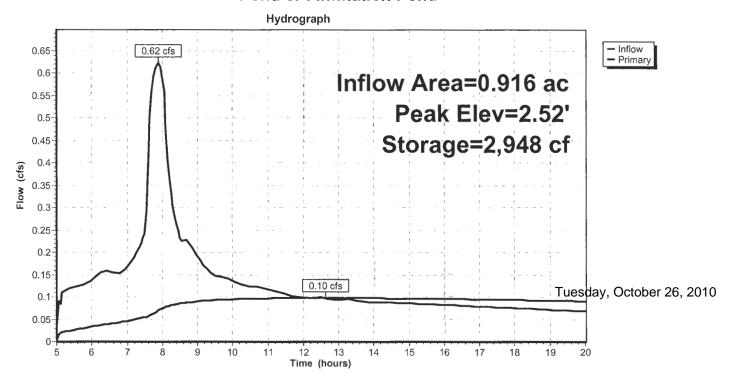
1=Exfiltration (Exfiltration Controls 0.10 cfs)

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Pond 6P: Infiltation Pond



Page 2

Summary for Pond 7P: Infiltation Pond

Inflow Area = 1.107 ac, 59.90% Impervious, Inflow Depth > 8.61" for 100yr-24hr event

Inflow = 2.98 cfs @ 8.35 hrs, Volume= 0.794 af

Outflow = 0.33 cfs @ 19.95 hrs, Volume= 0.299 af, Atten= 89%, Lag= 695.8 min

Primary = 0.33 cfs @ 19.95 hrs, Volume= 0.299 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 272.19' @ 19.95 hrs Surf.Area= 7,030 sf Storage= 21,556 cf Flood Elev= 275.00' Surf.Area= 12,242 sf Storage= 47,736 cf

Plug-Flow detention time=353.8 min calculated for 0.298 af (38% of inflow) Center-of-Mass det. time=158.5 min (849.4 - 690.9)

Volume Invert Avail.Storage Storage Description

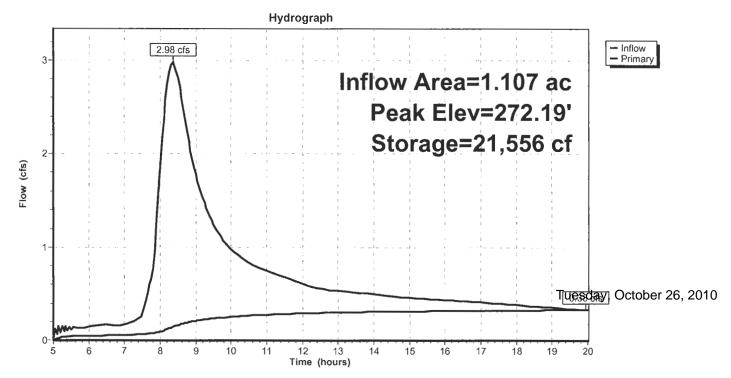
#1	266.00'	47,736 cf Custon	n Stage Data (Pr	ismatic)Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
266.00	778	0	0	1 dooddy, Golosof 20, 2010
267.00	1,454	1,116	1,116	
268.00	2,240	1,847	2,963	
269.00	3,160	2,700	5,663	
270.00	4,209	3,685	9,348	
271.00	5,393	4,801	14,149	
272.00	6,745	6,069	20,218	
273.00	8,211	7,478	27,696	
274.00	9,814	9,013	36,708	
275.00	12,242	11,028	47,736	

Device	Routing	Invert	Outlet Devices
#1	Primary	266.00'	2.000 in/hr Exfiltration over Surface area

Primary OutFlow Max=0.33 cfs @ 19.95 hrs HW=272.19' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.33 cfs)

Page 3

Pond 7P: Infiltation Pond



Page 4

Summary for Pond 8P: Infiltration Pond

Inflow Area = 1.436 ac, 31.72% Impervious, Inflow Depth > 7.54" for 100yr-24hr event Inflow = 0.903 af

Outflow = 2.90 cfs @ 8.34 hrs, Volume= 0.824 af, Atten= 13%, Lag= 12.4 min

 Primary =
 0.20 cfs @
 8.34 hrs, Volume=
 0.199 af

 Secondary =
 2.70 cfs @
 8.34 hrs, Volume=
 0.625 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 269.12' @ 8.34 hrs Surf.Area= 3,410 sf Storage= 5,569 cf Flood Elev= 275.00' Surf.Area= 9,452 sf Storage= 41,636 cf

Plug-Flow detention time=74.8 min calculated for 0.821 af (91% of inflow) Center-of-Mass det. time=32.2 min (719.2 - 687.0)

Volume Invert Avail.Storage Storage Description

		, , , , , , , , , , , , ,	1490 01014900	00011011011		
#1	267.00'	41,6	36 cf Custom S	Stage Data (Pris	matic)_isted below (Recalc)
Elevation	on Su	rf.Area	Inc.Store	Cum.Store	Tuesda	ay, October 26, 2
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	ruesua	ay, October 20, 2
267.0	00	1,867	0	0		
268.0	00	2,579	2,223	2,223		
269.0	00	3,314	2,947	5,170		
270.0	00	4,120	3,717	8,887		
271.0	00	4,998	4,559	13,446		
272.0	00	5,947	5,473	18,918		
273.0	00	6,959	6,453	25,371		
274.0		8,059	7,509	32,880		
275.0	00	9,452	8,756	41,636		
Device	Routing	Invert	Outlet Devices		·	
#1	Primary	267.00'	2.500 in/hr Ext	filtration over S	urface area	
#2	Secondary	268.16'	18.0" x 200.0'	Iong Culvert Cl	MP, projecting, no headwall	l, Ke= 0.900

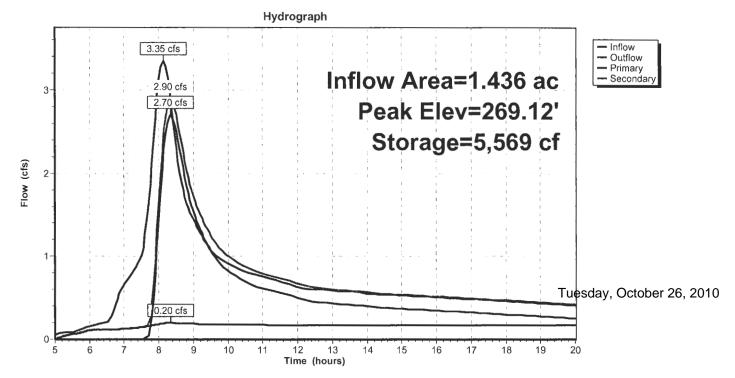
Outlet Invert= 267.57' S= 0.0030 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.20 cfs @ 8.34 hrs HW=269.12' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.20 cfs)

Secondary OutFlow Max=2.70 cfs @ 8.34 hrs HW=269.12' (Free Discharge) 2=Culvert (Barrel Controls 2.70 cfs @ 3.23 fps)

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Pond 8P: Infiltration Pond



Page 6

Summary for Pond 9P: Infiltration Pond

Inflow Area = 0.670 ac, 66.20% Impervious, Inflow Depth > 14.84" for 100yr-24hr event
Inflow = 3.20 cfs @ 8.10 hrs, Volume= 0.829 af
Outflow = 3.14 cfs @ 8.15 hrs, Volume= 0.822 af, Atten= 2%, Lag= 3.6 min
Primary = 0.05 cfs @ 8.15 hrs, Volume= 0.038 af
Secondary = 3.09 cfs @ 8.15 hrs, Volume= 0.785 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 269.43' @ 8.15 hrs Surf.Area= 1,111 sf Storage= 895 cf Flood Elev= 275.00' Surf.Area= 9,289 sf Storage= 23,629 cf

Plug-Flow detention time=8.2 min calculated for 0.820 af (99% of inflow) Center-of-Mass det. time=4.5 min (694.3 - 689.8)

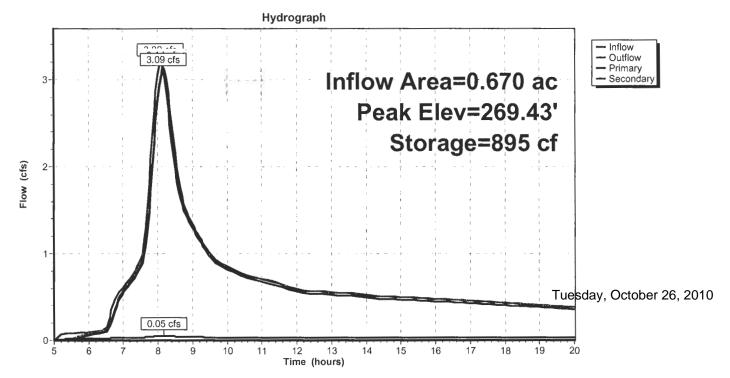
<u>Volume</u>	Invert	Avail.Sto	rage Storage l	Description		
#1	268.00'	23,62	29 cf Custom	Stage Data (Pri	smatic)_isted below	v (Recalc)
Elevation (feet)	Su	rf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		Tuesday, October 26, 2010
268.00		174	0	0		
269.00		800	487	487		
270.00		1,528	1,164	1,651		
271.00		2,400	1,964	3,615		
272.00		3,421	2,911	6,526		
273.00		4,566	3,994	10,519		
274.00		6,182	5,374	15,893		
275.00		9,289	7,736	23,629		
Device F	Routing	Invert	Outlet Devices	3		
	rimary Secondary	268.00' 268.36'	18.0" x 68.0'	•	MP, projecting, no h	neadwall, Ke= 0.900
			Outlet Invert=	$268.16^{\circ} S = 0.00$	029 '/' Cc= 0.900	n= 0.012

Primary OutFlow Max=0.05 cfs @ 8.15 hrs HW=269.43' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=3.08 cfs @ 8.15 hrs HW=269.43' (Free Discharge) 2=Culvert (Barrel Controls 3.08 cfs @ 3.22 fps)

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Pond 9P: Infiltration Pond



Page 8

Summary for Pond 10P: Infiltration Pond

Inflow Area = 0.383 ac, 40.78% Impervious, Inflow Depth > 23.79" for 100yr-24hr event Inflow 2.93 cfs @ 8.06 hrs, Volume= 0.759 af Outflow 8.11 hrs, Volume= 2.89 cfs @ 0.751 af, Atten= 2%, Lag= 3.1 min Primary 8.11 hrs, Volume= = 0.05 cfs @ 0.035 af Secondary = 2.84 cfs @ 8.11 hrs. Volume= 0.716 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 269.62'@ 8.11 hrs Surf.Area= 978 sf Storage= 879 cf Flood Elev= 275.00' Surf.Area= 9,933 sf Storage= 19,437 cf

Plug-Flow detention time=10.3 min calculated for 0.748 af (99% of inflow) Center-of-Mass det. time=5.2 min (698.5 - 693.3)

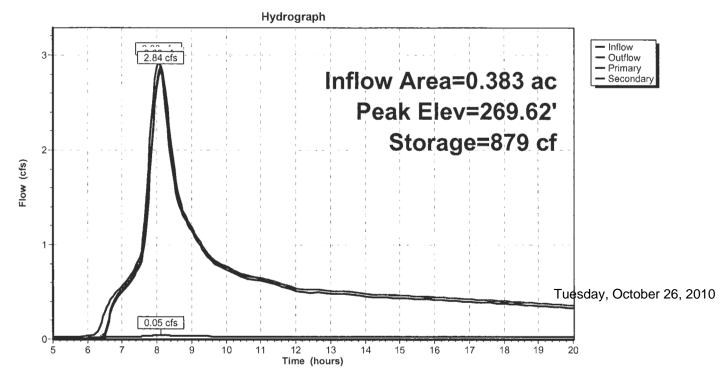
Volume	Invert	Avail.Sto	rage Storage	Description		
#1	268.00'	19,43	37 cf Custom	Stage Data (Pri	smatic)_isted below (Re	ecalc)
Elevation (feet		rf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Т	uesday, October 26, 2010
268.00)	144	0	0		
269.00)	626	385	385		
270.00)	1,197	912	1,297		
271.00)	1,857	1,527	2,824		
272.00)	2,606	2,232	5,055		
273.00)	3,443	3,025	8,080		
274.00		4,669	4,056	12,136		
275.00)	9,933	7,301	19,437		
Device	Routing	Invert	Outlet Devices	6		
	Primary Secondary	268.00' 268.61'	18.0" x 82.0'		Surface area MP, projecting, no head 030 '/' Cc= 0.900 n= 0	

Primary OutFlow Max=0.05 cfs @ 8.11 hrs HW=269.61' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=2.83 cfs @ 8.11 hrs HW=269.61' (Free Discharge) —2=Culvert (Barrel Controls 2.83 cfs @ 3.19 fps)

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Pond 10P: Infiltration Pond



Page 10

Summary for Pond 11P: Infiltation Pond

Inflow Area = 5.345 ac, 50.88% Impervious, Inflow Depth > 2.03" for 100yr-24hr event Inflow = 3.19 cfs @ 7.94 hrs, Volume= 0.904 af

Outflow = 2.95 cfs @ 8.05 hrs, Volume= 0.850 af, Atten= 7%, Lag= 6.8 min Primary = 0.13 cfs @ 8.05 hrs, Volume= 0.131 af

Secondary = 2.82 cfs @ 8.05 hrs, Volume= 0.720 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 270.25' @ 8.05 hrs Surf.Area= 2,766 sf Storage= 3,994 cf Flood Elev= 271.00' Surf.Area= 3,000 sf Storage= 6,162 cf

Plug-Flow detention time=56.6 min calculated for 0.847 af (94% of inflow) Center-of-Mass det. time=26.3 min (704.2 - 677.9)

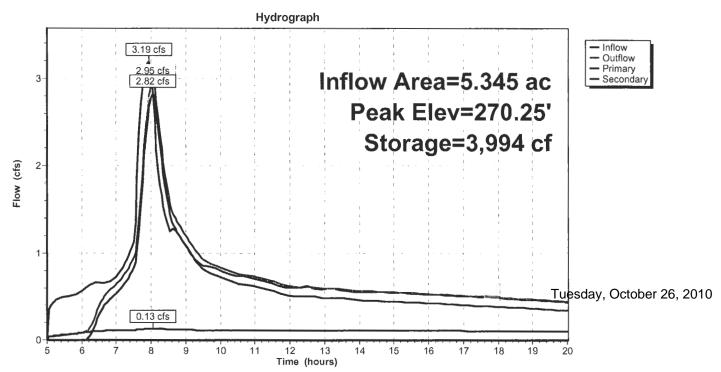
Volume #1	Invert 268.00'	Avail.Sto 6,16		Description Stage Data (Prisr	natic)Listed below	(Recalc)
Elevation (feet		rf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		Tuesday, October 26, 2010
268.00	0	819	0	0		
269.00	_	1,563	1,191	1,191		
270.00	0	2,689	2,126	3,317		
271.00	0	3,000	2,845	6,162		
Device	Routing	Invert	Outlet Devices			
#1	Primary	268.00'	2.000 in/hr Ex	filtration over Su	rface area	
#2	Secondary	269.30'			IP, projecting, no ł 5 '/' Cc= 0.900 n	neadwall, Ke= 0.900 n= 0.012

Primary OutFlow Max=0.13 cfs @ 8.05 hrs HW=270.25' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.13 cfs)

Secondary OutFlow Max=2.82 cfs @ 8.05 hrs HW=270.25' (Free Discharge)
—2=Culvert (Barrel Controls 2.82 cfs @ 3.42 fps)

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Pond 11P: Infiltation Pond



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Summary for Pond 15P: Infiltration Pond

Inflow Area = 0.849 ac, 63.23% Impervious, Inflow Depth > 1.95" for 100yr-24hr event

Inflow = 0.53 cfs @ 7.85 hrs, Volume= 0.138 af

Outflow = 0.11 cfs @ 10.04 hrs, Volume= 0.110 af, Atten= 79%, Lag= 131.2 min

Primary = 0.11 cfs @ 10.04 hrs, Volume= 0.110 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 1.45' @ 10.04 hrs Surf.Area= 2,443 sf Storage= 1,975 cf

Flood Elev= 3.00' Surf.Area= 4,363 sf Storage= 7,660 cf

Plug-Flow detention time=224.4 min calculated for 0.109 af (79% of inflow)

Center-of-Mass det. time= 124.1 min (771.4 - 647.3)

Volume	Invert	Avail.Sto	rage Storage	Description	
#1	0.00'	7,66	60 cf Custom	Stage Data (Prismatic)List	ed below (Recalc)
Elevation (feet)		.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.00		747	0	0	•
1.00		1,450	1,099	1,099	
2.00		3,655	2,553	3,651	
3.00		4,363	4,009	7,660	
Device Ro	outing	Invert	Outlet Device	es	
#1 Pr	imarv	0.00'	2.000 in/hr E	xfiltration over Surface are	ea

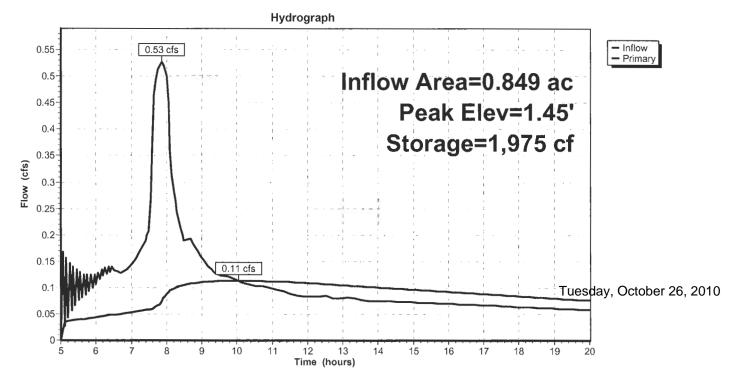
Primary OutFlow Max=0.11 cfs @ 10.04 hrs HW=1.45' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.11 cfs)

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Pond 15P: Infiltration Pond



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Summary for Pond 1: Infiltration Swale

Inflow Area = 0.485 ac, 80.62% Impervious, Inflow Depth > 2.48" for 100yr-24hr event

Inflow = 0.38 cfs @ 7.86 hrs, Volume= 0.100 af

Outflow = 0.09 cfs @ 9.82 hrs, Volume= 0.086 af, Atten= 77%, Lag= 117.9 min

Primary = 0.09 cfs @ 9.82 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 1.20' @ 9.82 hrs Surf.Area= 1,631 sf Storage= 1,339 cf

Flood Elev= 2.00' Surf.Area= 2,420 sf Storage= 2,878 cf

Plug-Flow detention time=194.9 min calculated for 0.086 af (86% of inflow)

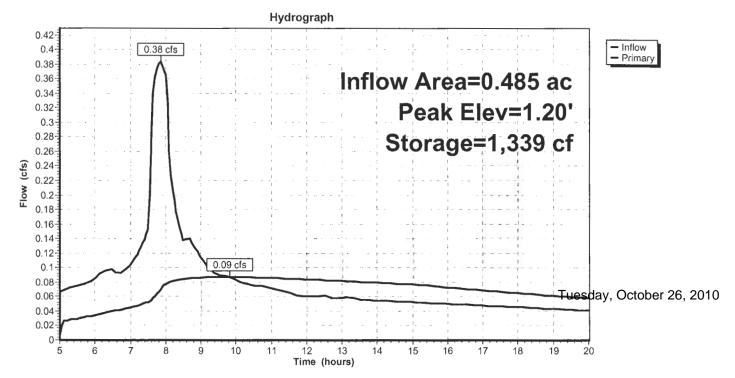
Center-of-Mass det. time= 122.4 min (767.9 - 645.6)

Volume	lnv	vert Ava	il.Storage	Storage	Description	
#1	0.	00'	2,878 cf	Custom	Stage Data (Prismatic)_isted below	-
Elevatio		Surf.Area (sq-ft)		c.Store pic-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.0	0	471		0	0	ruesday, October 20, 2010
1.0	0	1,432		952	952	
2.0	0	2,420		1,926	2,878	
Device	Routing	<u>Ir</u>	vert Ou	tlet Device	es	
#1	Primary	(0.00' 2.3	00 in/hr E	xfiltration over Surface area	

Primary OutFlow Max=0.09 cfs @ 9.82 hrs HW=1.20' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.09 cfs)

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Pond 1: Infiltration Swale



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Summary for Pond 2: Infiltration Swale

Inflow Area = 0.483 ac, 80.97% Impervious, Inflow Depth > 2.49" for 100yr-24hr event

Inflow = 0.38 cfs @ 7.86 hrs, Volume= 0.100 af

Outflow = 0.09 cfs @ 9.82 hrs, Volume= 0.086 af, Atten= 77%, Lag= 117.8 min

Primary = 0.09 cfs @ 9.82 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 1.20' @ 9.82 hrs Surf.Area= 1,630 sf Storage= 1,338 cf

Flood Elev= 2.00' Surf.Area= 2,420 sf Storage= 2,878 cf

Plug-Flow detention time=194.7 min calculated for 0.086 af (86% of inflow)

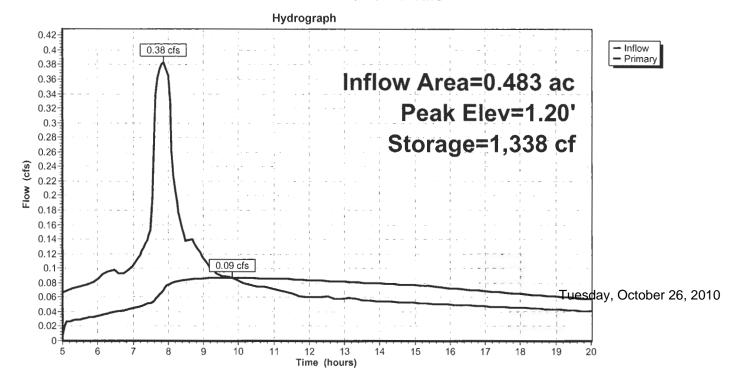
Center-of-Mass det. time= 122.3 min (767.9 - 645.6)

Volume	Invert	Avail.Sto	rage St	orage	Description	
#1	0.00'	2,8	78 cf C	ustom	Stage Data (Prismatic) Listed below	
Elevation (feet)	Sı	ırf.Area (sq-ft)	Inc.St (cubic-fe		Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.00		471		0	0	rucsday, October 20, 2010
1.00		1,432	(952	952	
2.00		2,420	1,9	926	2,878	
Device R	outing	Invert	Outlet I	Device	es	
#1 P	rimary	0.00'	2.300 i	n/hr E	xfiltration over Surface area	

Primary OutFlow Max=0.09 cfs @ 9.82 hrs HW=1.20' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.09 cfs)

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Pond 2: Infiltration Swale



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Summary for Pond 3: Infiltration Swale

Inflow Area = 0.483 ac, 80.97% Impervious, Inflow Depth > 2.49" for 100yr-24hr event

Inflow = 0.38 cfs @ 7.86 hrs, Volume= 0.100 af

Outflow = 0.09 cfs @ 9.82 hrs, Volume= 0.086 af, Atten= 77%, Lag= 117.8 min

Primary = 0.09 cfs @ 9.82 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 1.20' @ 9.82 hrs Surf.Area= 1,630 sf Storage= 1,338 cf

Flood Elev= 2.00' Surf.Area= 2,420 sf Storage= 2,878 cf

Plug-Flow detention time=194.7 min calculated for 0.086 af (86% of inflow)

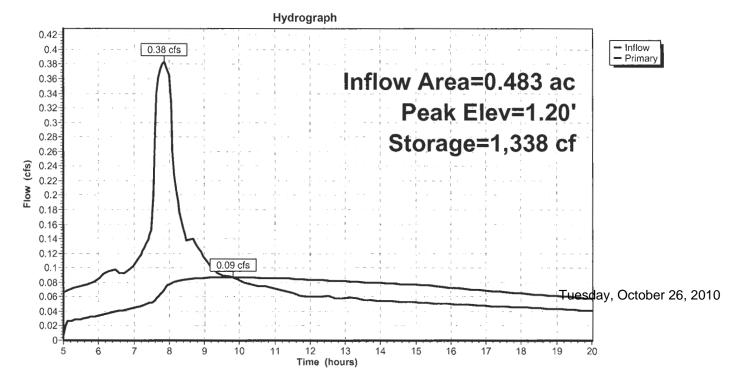
Center-of-Mass det. time=122.3 min (767.9 - 645.6)

Volume	Ir	vert	Avail.	Storage	Storage	Description			
#1	(0.00'		2,878 cf	Custom	Stage Data (Prismatic)Lis	sted below		
Elevatio (fee			.Area (sq-ft)		c.Store c-feet)	Cum.Store (cubic-feet)		Tuesday, October 26, 20°	10
0.0			471		0	0		rucsuay, October 20, 20	10
1.0	00		1,432		952	952			
2.0	00		2,420		1,926	2,878			
Device	Routin	g	lnv	ert Outl	et Device	s			
#1	Primar	γ	0.0	00' 2.30	0 in/hr E	xfiltration over Surface ar	rea		

Primary OutFlow Max=0.09 cfs @ 9.82 hrs HW=1.20' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.09 cfs)

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Pond 3: Infiltration Swale



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Summary for Pond 4: Infiltration Swale

Inflow Area = 0.217 ac, 46.43% Impervious, Inflow Depth > 1.44" for 100yr-24hr event

Inflow = 0.10 cfs @ 7.86 hrs, Volume= 0.026 af

Outflow = 0.03 cfs @ 8.76 hrs, Volume= 0.026 af, Atten= 65%, Lag= 54.4 min

Primary = 0.03 cfs @ 8.76 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.18' @ 8.76 hrs Surf.Area= 643 sf Storage= 171 cf

Flood Elev= 2.00' Surf.Area= 2,420 sf Storage= 2,878 cf

Plug-Flow detention time=37.4 min calculated for 0.026 af (99% of inflow)

Center-of-Mass det. time= 32.2 min (680.7 - 648.6)

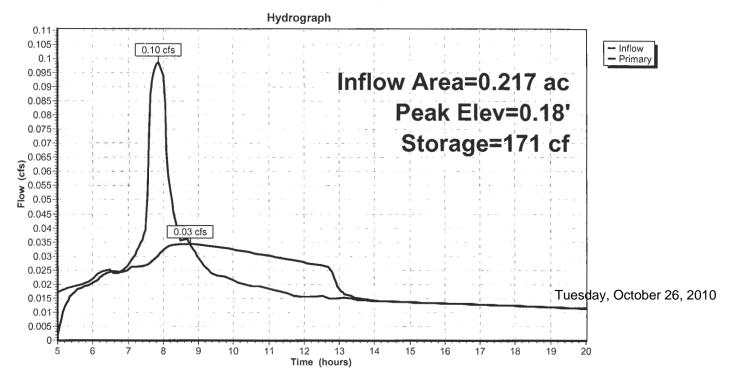
Volume	Ir	nvert	Avail.Sto	orage	Storage	Description	
#1	(0.00'	2,8	78 cf	Custom	Stage Data (Prismatic)_isted below	W
Elevation (fee			Area sq-ft)		Store c-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.0			471	-	0	0	1 de3day, October 20, 2010
1.0	00	1	,432		952	952	
2.0	00	2	2,420		1,926	2,878	
Device	Routin	ıg	Invert	Outle	et Devices	6	
441	Drimo	do a	0.00	2 20/	0 :/b E.	efilandian array Cristaga and	-

#1 Primary 0.00' 2.300 in/hr Exfiltration over Surface area

Primary OutFlow Max=0.03 cfs @ 8.76 hrs HW=0.18' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Page 9

Pond 4: Infiltration Swale



WT Ft. Lewis Developed Site-North Parking Area Type IA 24-hr 100yr-24hr Rainfall=4.10" Prepared by TranSystems Printed 11/25/2009

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Summary for Pond 7: Infiltration Swale

Inflow Area = 0.314 ac, 45.28% Impervious, Inflow Depth > 1.40" for 100yr-24hr event

Inflow = 0.14 cfs @ 7.86 hrs, Volume= 0.037 af

Outflow = 0.06 cfs @ 8.31 hrs, Volume= 0.036 af, Atten= 54%, Lag= 27.2 min

Primary = 0.06 cfs @ 8.31 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.06' @ 8.31 hrs Surf.Area= 1,380 sf Storage= 194 cf Flood Elev= 2.00' Surf.Area= 4,900 sf Storage= 3,019 cf

Plug-Flow detention time=26.1 min calculated for 0.036 af (98% of inflow)

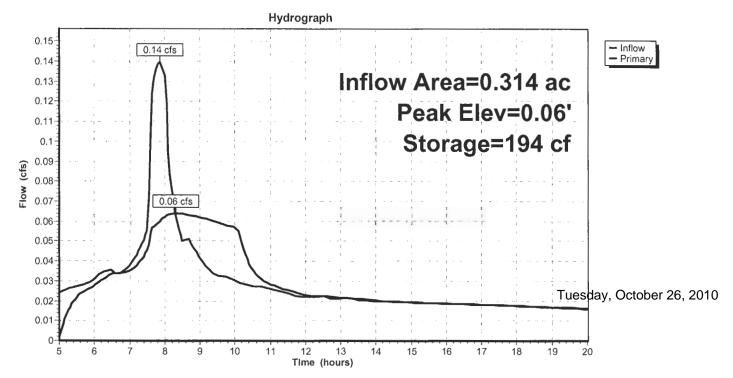
Center-of-Mass det. time= 19.0 min (667.7 - 648.7)

Volume	Invert	Avail.Sto	rage Storage	Description	
#1	0.00'	3,0	19 cf Custon	n Stage Data (Prismatic) isted belo	DW .
Elevation (feet)		.Area sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Turnella Catalan 00 0040
0.00		1,138	0	0	Tuesday, October 26, 2010
1.00	•	4,900	3,019	3,019	
Device Rou	uting	Invert	Outlet Device	es	
#1 Prir	mary	0.00'	2.000 in/hr E	Exfiltration over Surface area	

Primary OutFlow Max=0.06 cfs @ 8.31 hrs HW=0.06' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.06 cfs)

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Pond 7: Infiltration Swale



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Summary for Pond 8: Infiltration Swale

Inflow Area = 0.570 ac, 69.84% Impervious, Inflow Depth > 2.15" for 100yr-24hr event

Inflow = 0.39 cfs @ 7.86 hrs, Volume= 0.102 af

Outflow = 0.11 cfs @ 9.03 hrs, Volume= 0.102 af, Atten= 71%, Lag= 70.8 min

Primary = 0.11 cfs @ 9.03 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.27' 9.03 hrs Surf.Area= 2,469 sf Storage= 742 cf

Flood Elev= 2.00' Surf.Area= 4,350 sf Storage= 6,513 cf

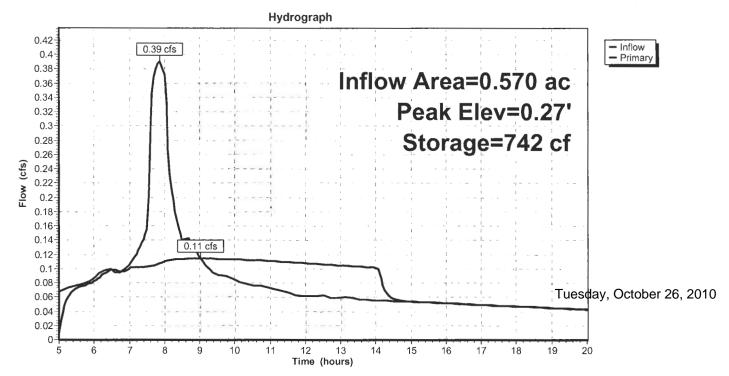
Plug-Flow detention time=47.0 min calculated for 0.102 af (99% of inflow) Center-of-Mass det. time=43.1 min (689.3 - 646.2)

Volume	Invert	_Avail.Sto	rage Storage	e Description	
#1	0.00'	6,5	13 cf Custon	n Stage Data (Prismatic)_isted below	,
Elevation (feet)		f.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.00 1.00 2.00		2,175 3,250 4,350	0 2,713 3,800	0 2,713 6,513	ruesuay, October 20, 2010
	uting mary	Invert 0.00'	Outlet Device	es Exfiltration over Surface area	

Primary OutFlow Max=0.11 cfs @ 9.03 hrs HW=0.27' (Free Discharge) —1=Exfiltration (Exfiltration Controls 0.11 cfs)

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Pond 8: Infiltration Swale



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Summary for Pond 9: Infiltration Swale

Inflow Area = 0.780 ac, 77.96% Impervious, Inflow Depth > 2.40" for 100yr-24hr event

Inflow = 0.60 cfs @ 7.86 hrs, Volume= 0.156 af

Outflow = 0.13 cfs @ 9.93 hrs, Volume= 0.147 af, Atten= 78%, Lag= 124.4 min

Primary = 0.13 cfs @ 9.93 hrs, Volume= 0.147 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.63' @ 9.93 hrs Surf.Area= 2,848 sf Storage= 1,699 cf

Flood Elev= 2.00' Surf.Area= 4,350 sf Storage= 6,513 cf

Plug-Flow detention time=140.3 min calculated for 0.147 af (94% of inflow)

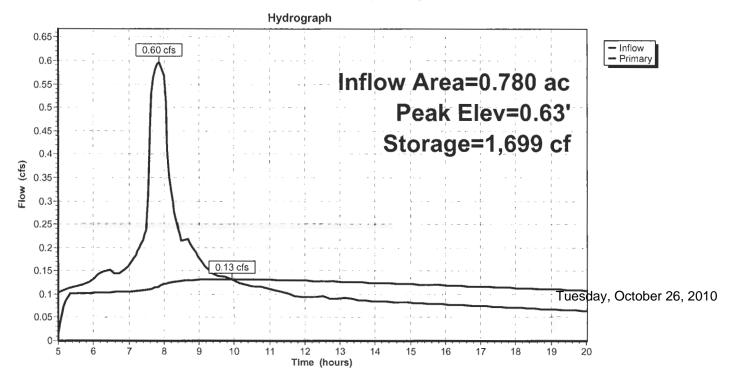
Center-of-Mass det. time= 108.4 min (754.1 - 645.7)

Volume	In	vert	Avail.Sto	rage	Storage	Description			
#1	0	.00'	6,5	13 cf	Custom	Stage Data (P	rismatic)_isted below		
Elevatio (fee		Surf.A (so	rea _I -ft)		.Store c-feet)	Cum.Store (cubic-feet)		Tuesday, October 26, 2010)
0.0	00	2,	175		0	0		1 dooddy, Oolobol 20, 2010	
1.0	00	3,2	250		2,713	2,713			
2.0	00	4,3	350		3,800	6,513			
Device	Routing	g	Invert	Outle	et Device	s			
#1	Primar	y	0.00'	2.00	0 in/hr E	xfiltration over	Surface area		

Primary OutFlow Max=0.13 cfs @ 9.93 hrs HW=0.63' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.13 cfs)

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Pond 9: Infiltration Swale



Page 16

Summary for Pond 12: Infiltation Pond

Inflow Area = 0.859 ac,100.00% Impervious, Inflow Depth > 3.07" for 100yr-24hr event

Inflow = 0.84 cfs @ 7.85 hrs, Volume= 0.220 af

Outflow = 0.24 cfs @ 9.07 hrs, Volume= 0.218 af, Atten= 71%, Lag= 72.9 min

Primary = 0.24 cfs @ 9.07 hrs, Volume= 0.218 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.41'@ 9.07 hrs Surf.Area= 5,218 sf Storage= 1,853 cf

Flood Elev= 5.00' Surf.Area= 18,869 sf Storage= 55,419 cf

Plug-Flow detention time=64.7 min calculated for 0.218 af (99% of inflow)

Center-of-Mass det. time=59.2 min (704.5 - 645.4)

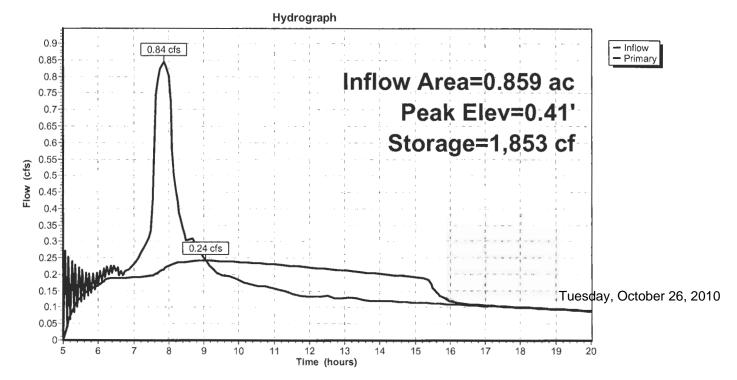
Volume #1		vert Ava	ail.Stora 55,419	<u> </u>	escription Stage Data (Prismat	tic)_isted below (Recalc)
Elevation (fee		Surf.Area (sq-ft)		Inc.Store cubic-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.0	00	3,911		0	0	ruesday, October 20, 2010
1.0	00	7,131		5,521	5,521	
2.0	00	9,615		8,373	13,894	
3.0	00	12,259		10,937	24,831	
4.(00	15,024		13,642	38,473	
5.0	00	18,869		16,947	55,419	
Device	Routing	g I	nvert (Outlet Devices		
#1	Primar	У	0.00' 2	2.000 in/hr Ext	iltration over Surfa	ice area

Primary OutFlow Max=0.24 cfs @ 9.07 hrs HW=0.41' (Free Discharge)

1=Exfiltration (Exfiltration Controls 0.24 cfs)

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Pond 12: Infiltation Pond



WT Ft. Lewis Developed Site-North Parking Area Type IA 24-hr 100yr-24hr Rainfall=4.10"

Prepared by TranSystems

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Page 2

Summary for Pond 14: Infiltation Pond

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth > 3.07" for 100yr-24hr event

Inflow = 0.20 cfs @ 7.85 hrs, Volume= 0.052 af

Outflow = 0.06 cfs @ 9.03 hrs, Volume= 0.051 af, Atten= 71%, Lag= 70.4 min

Primary = 0.06 cfs @ 9.03 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 0.61'@ 9.03 hrs Surf.Area= 1,277 sf Storage= 528 cf

Flood Elev= 2.00' Surf.Area= 3,115 sf Storage= 3,581 cf

Plug-Flow detention time=97.5 min calculated for 0.051 af (98% of inflow)

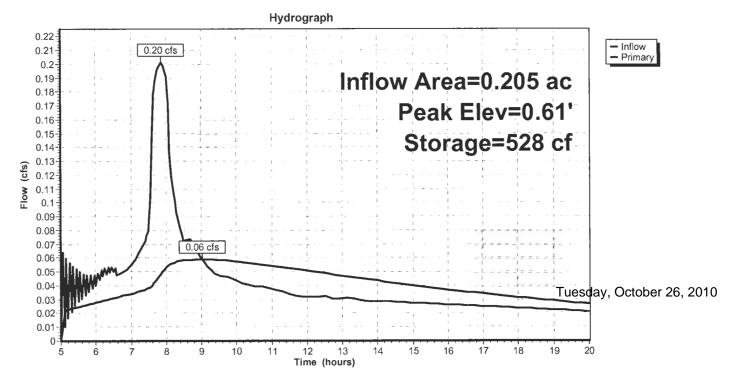
Center-of-Mass det. time= 85.9 min (731.2 - 645.4)

Volume	Inve	ert Avai	I.Storage	Storage	Description	
#1	0.0	00'	3,581 cf	Custom	Stage Data (Prism	atic)Listed below (Recalc)
Elevation (feet		Surf.Area (sq-ft)	*****	c.Store c-feet)	Cum.Store (cubic-feet)	Tuesday, October 26, 2010
0.00 1.00 2.00	0	445 1,801 3,115		0 1,123 2,458	0 1,123 3,581	
	Routing Primary			et Device	s kfiltration over Surf	ace area

Primary OutFlow Max=0.06 cfs @ 9.03 hrs HW=0.61' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.06 cfs)

Page 3

Pond 14: Infiltation Pond



Appendix D

Geotechnical report

Tuesday, October 26, 2010

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Appendix E

Operations and Maintenance Plan

Tuesday, October 26, 2010

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Stormwater Operations & Maintenance Plan

US Army Corps of Engineers Seattle District

November 25, 2009

Prepared by: Transystems Corporation

Responsibility

The stormwater structures and infiltration ponds facilities located on the subject property shall be maintained by the US Army Corps of Engineers. It is the responsibility of U.S.A.C.E to maintain the facilities according to the requirements of the Fort Lewis Utility. A specific description of responsible maintenance and schedules follow below. As a property owner, you are legally required to follow the maintenance tasks and schedules specified in the operations and maintenance (O&M) plan for your facility.

Description

All stormwater runoff from the site's impervious pavements will sheet flow into catch basins, and ultimately into infiltration ponds. All stormwater structures and infiltration facilities shall be maintained to preserve their intended function of managing stormwater runoff to prevent property damage and to protect the environment. Stormwater runoff from paved areas for vehicle use shall be treated by infiltration ponds that contain soil with a minimum of 18 inches in depth per Stormwater Management Manual for Western Washington.

Inspection and Maintenance schedule

Each part of the system shall be inspected and maintained quarterly and within 48 hours after each major storm event. For this O&M Plan, a major storm event is defined as 1.0 inches of rain in 24 hours or more. All components of the storm system as described above must be inspected and maintained frequently or they will cease to function effectively. The facility owner shall keep a log, recording all inspection dates, observations, and maintenance activities. Receipts shall be saved when maintenance is performed and there is record of expense. It is responsible to keep inspection and maintenance logs of your facility. In general, the quarterly logs should note inspection dates, the facility components inspected, and any maintenance or repairs made. A copy of the Maintenance Log is located in this Appendix.

Inspection and Maintenance Procedure

Infiltration Pond:

- Vegetation or roots from large shrubs and trees that limit access or interfere with planter operations shall be prevented.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed biannually.
- Nuisance and prohibited vegetation of all species shall be removed biannually.
 Invasive vegetation shall be removed and replaced.
- Dead vegetation shall be removed to maintain less than 10% of area coverage or when planter function is impaired. Vegetation shall be replaced within 3 months or immediately if the season is appropriate in order to maintain cover density and control erosion where soils are exposed.
- The stormwater facilities shall be inspected within 48 hours after a storm event. if
 water continues to pond after that time, sources of possible clogging shall be
 identified and corrected. If necessary, the top layers shall be tilled and amended
 with compost; if this is not sufficient, they shall be removed and replaced with
 new freely draining growing medium.
- Inlets and outlets shall be inspected quarterly and after any large rain even.
- Any trash or debris that collects in the planter and may inhibit planter function shall be removed quarterly.

Source Control measures prevent pollutants from mixing with stormwater. Typical non-structural control measures include raking and removing leaves, street sweeping, vacuum sweeping, and limited and controlled application of pesticides, herbicides, and fertilizers.

- Source control measures shall be inspected and maintained quarterly.
- Signage shall be maintained.

Spill Prevention measures shall be exercised when handling substances that can contaminate stormwater. Virtually all sites, including residential and commercial, present dangers from spills. It is important to exercise caution when handling substances that can contaminate stormwater. Activities that pose the chance of hazardous material spills shall not take place near collection facilities.

- The proper authority and the property owner shall be contacted immediately if a spill is observed.
- A spill kit shall be kept near spill-prone operations and refreshed annually.
- Employees shall be trained on spill control measures.
- Shut-off valves shall be tested quarterly.
- Releases of pollutants shall be corrected within 12 hours.

Insects and Rodents shall not be harbored in any part of the storm system.

- Pest control measures shall be taken when insects/rodents are found to be present. Standing water and food sources shall be prevented.
- If sprays are considered, a mosquito larvicide such as Bacillus thurendensis or Altoside formulations can be applied only if absolutely necessary and shall not be used where it will enter groundwater or come into contact with any standing water. Sprays shall be applied only by licensed individuals or contractors.
- Holes in the ground located in and around the storm system shall Beestley. October 26, 2010
- Outfalls draining into vegetated swales shall be inspected and cleaned regularly to ensure no rodent activity, which can clog or decrease the efficiency of the storm system.

Access shall be maintained for all facilities so operations and maintenance can be performed as regularly scheduled.

Treatment Measure Operation and Maintenance

Inspection Report to the

Fort Lewis Public Works, Fort Lewis Washington

This report and attached inspection checklists document the inspection and maintenance conducted for the identified stormwater treatment measure(s) subject to the Maintenance Agreement between the City and the property owner during the annual reporting period indicated below.

l.	Property Information:	
Property	Address or APN:	
Property	Owner:	
II.	Contact Information:	
Name of	person to contact regarding this report:	
Phone n	umber of contact person: Email:	
Address	to which correspondence regarding this report should be directed:	Tuesday, October 26, 2010

III. Reporting Period:

This report, with the attached completed inspection checklists, documents the inspections and maintenance of the identified treatment measures during the time period from <u>January 1</u> to <u>December 15</u> annually.

IV. Treatment Measure Information:

The following stormwater treatment measures (identified treatment measures) are located on the property identified above and are subject to the Maintenance Agreement:

Identifying Number of Treatment Measure	Type of Treatment Measure	Location of Treatment Measure on the Property
1	Infiltration Pond	Refer to Site Map
2	Catch Basins	Refer to Site Map

V: Sediment Removal		
Total amount of accumulated sedime reporting period: cubic y	ent removed from the stormwater treatment measure(s) during yards.	the
The sediment was removed and dispe	osed as follows:	
VI. Inspector Information:		
The inspections documented in the a inspector(s):	attached inspection checklists were conducted by the following	
Inspector Name and Title	Inspector's Employer and Address	
VII. Statement of Treatment		
Based on the inspections documented in this report present, functional and no.)	d in the attached checklists, is (are) the treatment measure(s) to being maintained as required by the Maintenance Plan? (Checklists)	esday, October 26, 2010 ck yes or
YESNO		
If "NO", describe problem, propos	sed solution and schedule of correction:	
VIII. Certification:		
I hereby certify, under penalty of pertrue and complete:	rjury, that the information presented in this report and attachme	ents is
Signature of Property Owner or Other	er Responsible Party Date	
Type or Print Name		
Company Name		
Address		-

Phone number: Email:

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Treatment Measures Operation and Maintenance Inspection Checklist:

Refer to Exhibits B and C for the Location and Maintenance Plan of the specific Stormwater Treatment Measures.

	GENERAL I	NFORMATION				
Project Name						
Inspector's Name			-			
Inspector's Title						
Signature						
Date of Inspection			Tue	sday, October 26, 2		
Stormwater Treatment Measures:	☐ Infiltration Pond ☐ Catch Basins					
Required Bi-Annual Inspections for Stormwater Treatment Measures (Check Applicable):	August 1 - October 1 - Before May 1 - Assumed end of wet	•		for Winter		
Additional Inspections (Check Applicable):	☐ Prior to forecast rain ☐ 24-hr intervals during extende	ed rain	☐ After a rain event ☐ Other			
Season (Check Applicable)	Rainy		☐ Non-Rainy			
6 . D.	Storm Start Date & Time:		Storm Duration (hrs):			
Storm Data	Time elapsed since last storm (Circle Applicable Units)	Лin. Hr. Days	Approximate Rainfall Amount (inches)			

See attached checklist

Stormwater Treatment Measures. (Refer to the Stormwater Operations & Maintenance Plan)

	II	NSPECTION REQU	JIRE	ME	NTS	
W.E.	Requirement		Yes	No	N/A	Corrective Action (Indicate Location. Attach additional sheets if necessary)
Infiltration Pond M	laintenance Checklist					
Is there debris, silt, li	itter, or sediment aroun	d the outlet structure	?			
Is there Debris, Litter of 1" deep) anywhere	r, or accumulated Silt of in the swale?	or Sediment (in exces	S			
Are the protection ro the pond from erosio	ocks at the outfall uniform?	rm and able to protec	t			
Is the vegetation ever protect the pond from	rywhere in the pond un m erosion?	iform and able to				
During and after a ra hour?	in event is the pond ab	le to drain within 48				
Is there silt or sedime swale that would pre	ent mixed within the to event plant growth?	p soil medium of the				Tuesday, October 26, 2
Is there Debris, Silt,	Litter, or Sediment in t	he outlet pipe?				
Are there protection the pond?	rocks or patches of veg	getation missing from				
Is there visible erosion	on occurring anywhere	in the pond?				
Do any riprap rocks	block the outlet?					
Are there any weeds	or unwanted vegetation	n in the pond?				
Is there any oil or vis	sible pollutant build-up	anywhere in the				
	ter inside the swale that t would cause a concer		er			
working properly and	gment is the Vegetated d able to treat the storm e manner as it is intended	nwater runoff in an	е			
Is more frequent or i	n-depth inspections nee	eded?				

INSPECTION REQU	IRE	MEN	NTS		
Requirement	Yes	No	Τ	Corrective Action (Indicate Legation	
Catch Basins					
Is there debris, silt, litter or sediment around the Catch Basin grates?					
Is debris, silt, litter or sediment collecting in the sump of the Catch Basins?					
Are the outlet pipes of the Catch Basins blocked by debris, silt, litter or sediment?					
Is there vegetation growing inside the Catch Basins?					
During and after a rain event are the Catch Basins able to drain within 1 hour?					
Is there visible erosion occurring anywhere around the catch Basins?					
Are there any weeds or unwanted vegetation around the Catch Basins?					
Is there any oil or visible pollutant build-up anywhere in the Catch Basins?					
Is there standing water inside the Catch Basins that would require further maintenance and that would cause a concern for breading mosquitoes?				Tuesday, October 26, 2	
Giving your best judgment are the Catch basins working properly and able to collect and convey the stormwater runoff in an efficient and effective manner as it is intended to do?					
Is more frequent or in-depth inspections needed?					

Maintenance Log:

Record date, description and responsible individual for maintenance activities:

Date:	Initials:	
		İ
Work performed:		
Details:		
Date:	Initials:	
work performed by:		
Work performed:		
Details:		
l .		1
-		
Date:	Initials:	
Work portorned by		
work performed by:	· · · · · · · · · · · · · · · · · · ·	Tuesday, October 26, 2010
Work performed:		
Details:		
Date:	Initials:	
Work performed by:		
Details:		
Date:	Initials:	
Work performed		
Dataile		
I .		I
Date:	Initials:	
Work performed by:		
Work performed:		
Details:		
D .	T 1	
Date:	Initials:	
Work performed by:		
Work performed:		
Details:		

Appendix F

Record of Survey with Legal Description

Tuesday, October 26, 2010

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Sanitary Sewer Calculations

WARRIORS ON TRANSITION FORT LEWIS, WASHINGTON

Prepared for: ARMY CORPS OF ENGINEERS

November, 2009

TranSystems Project No. P501090081



TranSystems

1845 NE Couch Street Portland, OR 97232-3054 Tel (503) 232-2117 Fax (503) 232-8023 www.transystems.com

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TranSystems

1845 NE Couch Street Portland, OR 97232-3054 Tel (503) 232-2117 Fax (503)-232-8023

www.transystems.com

The following summarizes the sanitary sewer calculations methodology for TheWarriors in Transition Barracks project Fort Lewis Washington.

The project connection point for discharge is an manhole that contains a 10 inch pipe.

The population basis for design included 1000 people. The sanitary capacity was determined using the population basis with the following calculations:

Q(peak)
$$\div$$
 Q(ave.)= (18 $+$ $\stackrel{\frown}{P}$) \div (4+ $\stackrel{\frown}{P}$) (P=population in thousands)
=3.8 (Ave. flow = 125 gpcd)

Q(peak) =
$$[(125 \text{ gpd})\times(3.8)\times(1000)\times(0.1337\text{ft}^3/\text{gal.})] \div [(24\text{hpd})\times(60 \text{ mph})\times(60\text{spm})]$$

= 0.74 ft^3/sec.

The main line collection pipe will be a 10 inch line and will connect to the existing manhole as shown. The building piping has been calculated by Hankins & Anderson.

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Water Calculations

WARRIORS ON TRANSITION FORT LEWIS, WASHINGTON

Prepared for: ARMY CORPS OF ENGINEERS

November, 2009

TranSystems Project No. P501090081



TranSystems

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TranSystems

1845 NE Couch Street Portland, OR 97232-3054 Tel (503) 232-2117 Fax (503)-232-8023

www.transystems.com

The following summarizes water calculations for The Warriors in Transition Barracks project Fort Lewis Washington.

The hydrant type is class A with rated capacity of 1000-1499 gpm flow.

The population basis for design included 1000 people. The fire flow was determined using the population basis and the following calculation:

Q(gpm) =
$$1020 \times \vec{P} (1-0.01 \sqrt{P})$$

=1009.8 gpm

Existing site supply

Flow test results

- -60 psi static
- -58 psi residual
- -984 gpm flowing
- -16 inch diameter pipe

The site is supplied by (2) 16 inch diameter water lines
The hydrant pipe sizing is based on standard required diameter of 6 inches.
The building demand piping has been calculated by Hankins & Anderson.

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Warriors in Transition Barracks Fort Lewis, Washington

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APPENDIX 5 STRUCTURAL DESIGN CALCULATIONS

(To Be Included in Package B Submittal)

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Warriors in Transition Barracks Fort Lewis, Washington

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APPENDIX 6 ARCHITECTURAL DESIGN CALCULATIONS

(To Be Included in Package C-1 Submittal)

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Warriors in Transition Barracks Fort Lewis, Washington

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APPENDIX 7 MECHANICAL DESIGN CALCULATIONS/CUT SHEETS

(To Be Included in Package C-1 Submittal)

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Warriors in Transition Barracks Fort Lewis, Washington

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APPENDIX 8 ELECTRICAL DESIGN CALCULATIONS

(To Be Included in Package C-1 Submittal)

Section: Appendix II

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Warriors in Transition Barracks Fort Lewis, Washington

APPENDIX 9 ANTITERRORISM/FORCE PROTECTION ANALYSIS

Antiterrorism/Force Protection (ATFP) Considerations

Per DoD Minimum Antiterrorism Standards for Building, UFC 4-010-01, the barracks are considered as billeting, in which 11 or more unaccompanied DoD personnel are routinely housed. A summary of AT/FP requirements per UFC 4-010-01 is provided below:

<u>Standard 1, Standoff Distances</u>: The proposed barracks are well within the requirement from the installation controlled perimeter and will have an 82 feet stand-off from parking and roads and conventional construction methods utilized. The dumpsters will be located a minimum of 82 feet from the buildings.

<u>Standard 2, Unobstructed Space</u>: There will not be obstructions within 33 feet of the barracks that would allow for concealment of explosive devices 6 inches or greater in height.

<u>Standard 3, Drive–Up/Drop–Off Areas</u>: Drive up and drop off areas, will be clearly marked to prevent parking of vehicles and will not be located under any inhabited portion of a building.

<u>Standard 4, Access Roads</u>: Where access roads are necessary for the operation of a building (including those required for fire department access), control measures will be implemented to prohibit unauthorized vehicles from using access roads within 82 feet of the barracks.

All-Weather Ground Access (UFC 03-600-01): The buildings will have one means of all-weather ground access to allow emergency vehicles unimpeded access to the building and will terminate no farther than 33 feet from the building.

Access to Residential Facilities (UFC 03-600-01): The buildings will have all-weather ground access to a minimum of 2 sides having access to sleeping rooms.

Vehicle Access (UFC 03-600-01): All force protection equipment will not require more than one person to remove or open.

Aerial Apparatus Access (UFC 03-600-01): The buildings will provide suitable all-weather ground access surface for aerial apparatus on a minimum of two sides of the perimeter of the structure.

Standard 5, Parking Beneath Buildings or on Rooftops: Not applicable because none are planned.

<u>Standard 6, Progressive Collapse Avoidance</u>: The buildings will be constructed to meet the progressive collapse requirements of the UFC.

<u>Standard 7, Structural Isolation</u>: Not applicable, these will be independent new buildings, meeting the conventional constructions standoff, with the same construction standards throughout.

Standard 8, Building Overhangs: Not applicable, none with occupied areas above are planned.

Warriors in Transition Barracks Fort Lewis, Washington

Standard 9, Exterior Masonry Walls: Not applicable, none are planned.

Standard 10, Windows and Skylights: The buildings will be at the conventional construction standoff distance of 82 feet, Low Level of Protection, with a Level II explosive charge. UFC 4-010-01, Table B-3, Insulated Glass Units, was used to determine the glazing requirements. At least the inner glazing panel will be a laminate of two nominal 1/8-in annealed glass panes bonded together with a minimum of a 0.030in polyvinyl-butyral (PVB) interlayer. Frames and windows will be aluminum or steel. The frame bite will be 3/8 inches for structurally glazed, 1 inch for non-structurally glazed applications. The framing system will be constructed to restrict the glazing deflection to 1/160 of the glazing length and to resist 96psf which is two times the 3-second blast load computed using ASTM F 2248 at a distance of 82 feet.

<u>Standard 11, Building Entrance Layout</u>: The locations of the barracks are well away from the installation perimeter, and not subject to observation from uncontrolled key vantage points outside the installation.

Standard 12, Exterior Doors: All exterior doors into inhabited areas will open outwards.

<u>Standard 13, Mail Rooms:</u> Not applicable since mail sorting function will not be provided at the WT Barracks.

Standard 14, Roof Access: There will be no external roof access. Roof access will be supplied per the requirements of the fire protection code through locked roof hatches and ladders originating from the top landing of each stairwell.

<u>Standard 15, Overhead Mounted Architectural Features:</u> Overhead mounted features weighing 31 pounds or more will be mounted to resist forces of 0.5 times the component weight in any horizontal direction and 1.5 times the component weight in the downward direction.

<u>Standard 16, Air Intakes</u>: Outside air intakes that distribute air throughout the building will be at least 10 feet above the ground or roof-mounted to preclude the introduction of contaminants.

<u>Standard 17, Mail Room Ventilation</u>: Not applicable since mail sorting function will not be provided at the WT Barracks.

<u>Standard 18, Emergency Air Distribution Shutoff</u>: An easily accessible emergency shutoff switch in the HVAC control system will be provided.

<u>Standard 19, Utility Distribution and Installation</u>: Critical or fragile utilities will be routed, to the extent possible, so that they are not on exterior walls.

<u>Standard 20, Equipment Bracing</u>: All overhead utilities and other fixtures weighing 31 pounds or more will be mounted to resist forces of 0.5 times the equipment weight in any horizontal direction and 1.5 times the equipment weight in the downward direction

Standard 21, Under Building Access: Not applicable as none are planned.

Standard 22, Mass Notification: A Mass Notification System will be provided.

Section: Appendix II

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APPENDIX 10 GEOTECHNICAL REPORT

(To Be Included in Package B Submittal)

Section: Appendix II

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Signature

Name

Mary R. Erchul, PE

Date

Drawing Production Epiloque:

[] Applicable / [] Not Applicable

Review follow-up list and verify all pick ups made

If appropriate, eliminate information called out in more than one location on the drawings. If not, assure information is consistent in each location.

Verify that all section callouts are cut and noted from the plans

Verify that Specifications match the drawing notes

Complete yellow pencil check by independent checker

Verify all red-marks reviewed with design engineer

Verify reviewer sign off on all sheets

Verify details not used removed from drawings

Check set retained for files until construction is complete

Coordination All Plans, General:

[X] Applicable / [] Not Applicable

1 No 2 Yes Dare all drawings oriented with the North arrow pointing upward or to the right? Is

plan North shown where applicable?

Not to scale items labeled NTS

Existing construction shown as double dashed line or labeled

"EXISTING". (buildings, sidewalks, trees, curbs, paving, utilities, etc.)

New construction located with respect to existing.

"Field Verify" dimensions clearly noted and reasonable Is work that is not included in the scope of the contract but is shown on the

drawings identified by one of the following notations as applicable:

"Not included in this contract"

- "Not in contract"
- "Government furnished equipment"
- "Owner furnished equipment"
- "By the Government"
- "By the Owner"

Plan Coordination Civil:

Applicable / [] Not Applicable

No-check Sheet

Are the topographic survey drawings drawn at scales of 1 inch = 10 ft. 1 in = 20 ft. or 1 in = 40 ft? Note that any of the three scales is acceptable but drawing scales should be consistent.

Verify that all details pertaining to individual site items listed below are shown on drawings:

- Location Maps Yes
- Site Plans VCS

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only shown or

elevations to be sut

No mechorplumbir drawings referen

No profiling privide out based on invert

None noted

No architectural or

structural plans in

this package orbivil

yes

Extension of Utilities - Yes

Soil Boring Logs - No

Foundation Plans - NO(N/A)

Foundation Details - Not Included in this package

Is the orientation for the site plans shown identically throughout? No property lines show Do the site plan property line dimensions agree with the architectural drawings?

imits of work not shown Limits of construction, clearing, grading, sodding, grass or mulch are shown and are consistent in other disciplines.

11/25/09 Does site design appropriately consider the sequence of construction?

Site grading

Underground utility installation

- Under building drainage or dewatering
- **Building construction**
- Site paving
- Site landscaping

Are haul routes and laydown areas shown and are they consistent on all drawings?

Verify that sanitary and storm drainage system outlets and manholes agree with mechanical and plumbing drawings for locations and elevations.

Do not have elevations New underground utilities (power, telephone, water, sewer, gas, storm drainage, fuel lines, grease traps, fuel tanks) have no interferences.

Existing power/telephone poles, pole guys, street signs, drainage inlets, valve boxes, manhole covers, etc do not interfere with new driveways, sidewalks, or other site improvements.

Check profiles of all underground lines with finish grades to ensure sufficient

Ribfile sheet shows other existing and interfacing underground utilities and avoid conflicts.

No mech demolition drawings with mechanical demolition drawings for items, methods, limits, and location of demolition.

Are environmental concerns such as asbestos, contaminated soil or PCB handling and disposition addressed in demolition drawings or specifications?

Verify that building plan dimensions agree with architectural and structural drawings.

Verify that existing, new work, and demolition work is identified and that it agrees and electrical Shown with the civil, structural, architectural, mechanical, and electrical drawings. Check items are noted, Salvage, Relocate, Reuse, Abandon in Place, or Remove.

Check and verify site plan interferences, existing above and underground utilities, septic tank, leach fields, natural drainage flows, gas, water, sanitary sewer, storm Notdimensioned sewer, electrical, telephone and cable Tibow

Locate clearing and grubbing limits. Dimension areas of pavement removal. Note Coccuted saw cuts if required. Note to plug sewer lines abandoned in place.(NA)

Check pad grades with earthwork materials and finish elevations. Verify 🚄 🗖 forizontal and vertical limits as well as the correctness of the amount of excavation, recompaction, and site or import fill materials required. Check for positive natural drainage away from pad.

Verify excavation plan and sections provided for building earthwork if appropriate. Check appropriate traffic pattern, paving selections, limits and edge conditions and fencing and security. Check logical patterns of paving for circulation, fire access. Check paving materials selection based on usage.

Check roadway turn radius and paving thickness. Verify curbing types, parking and sidewalk layouts.

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No pad grades an notavailable

		was wis package	Page 476 of 572
	0000	N/A this package	
8	see notes	Check handicapped provisions, number of parking spaces (handicapped ar non-handicapped), allowance for compact cars, ramps, trash pick-up location	nd s(NA)
		public phones, and night lighting coverage (pood)	
	X	Verify appropriate location of poles, drain inlets, valve boxes, manholes, che	
		coverage over underground tanks, vaults, utilities, landscape and fire protection	on
11-110	10	systems and confirm access for service.	1.00
Nosoils	No	Verify that the plans and specification include all applicable geotechnical and su	
report)		surface information that is available to depict anticipated in-situ materials ar conditions. Soil borings and test pits located on plan.	la
	×	Verify that all terms used to locate or delineate earth and site work materials a	re
		specifically defined in the appropriate specifications sections and/or the gener	
- 1	,	notes sheet.	
Nosoi	Isreport	Verify that earthwork materials and execution agree with any Owner criteria ar	id 🛘
	~	soils report requirements.	
		Check use of industry standards, nonproprietary items. Check that custom wo	rk
	NIA	or special conditions are addressed. Verify that legal description of property included if appropriate.	
	NA	Verify that address of property included if appropriate.	
stoan a	N/A	Verify easements shown if appropriate.	
Sheet delta	1 1 1 NO	Verify vertical datum and horizontal control established.	
Met de	yes	Verify fire hydrant locations shown if appropriate.	
	N/A	Verify profiles of all main utility lines provided if appropriate.	11 - Tox Ad
	NO	9-1-1-1	11/25/04 - 100
	NO		11/23/01
	VES	Verify air release valves for vertical crest water lines provided if appropriate. Verify connection of building downspouts to storm sewer.	
	7	Verify connection of footing drains to storm sewer.	
	X	Fire hydrants and street light poles do not conflict with other above ground items	
(N/A)NO	ot noted	Horizontal distances between drainage structures and manholes match scale	ed - Correcte
City		dimensions and stated dimensions on both plan and profile sheets.	11/25/0
	No	All existing and proposed grades are shown.	
	Plan Coordina	ation Architectural Interface: (Not in this package)	
		. 0	
	[] Applican	ole / [X] Not Applicable	
		In general, use overlay light table process to verify and coordinate drawings of a	ali
		disciplines to detect and correct conflicts, interferences between drawings as we	ell :
		as errors and omissions.	
		Coordinate architectural site plan and floor plans, check overall dimension	S,
		check orientation. Coordinate architectural site plan and civil grading plans, verify finish flo	or
		elevations, check orientation and dimensions.	Ji
		Coordinate architectural plans and landscape plans. Check overall dimension	S.
		Verify planting irrigation plans with architectural plans. Check all locations of pla	
		materials and irrigation appurtenances for conflicts and interfaces especially	
		entries and walkways.	
		Coordinate and verify all utilities service entrances with architectural floor plan	
		Ascertain that steam, fire protection, water risers, roof drain connections points	or
		spill boxes are coordinated. Check locations of electrical service entrance on architectural plan, ascertain th	at
		there are details for installation of cabinets, large conduits, switches, etc. and the	
		they are not unsightly.	

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***************************************	Coordinate architectural floor plans with structural, mechanical, electrical, and equipment plans, if any. Make sure all overall dimensions are correct. Ascertain
	that all internal dimensions are taken from the same reference points:
	Face of wall
	Edge of slab Contains of portitions
	Centerline of partitions,Column grid lines
	Coordinate finish floor elevations with top of slab on structural drawings. Check
	slab depression on structural plan for non-resilient floor tile installation (if
	applicable)
<u>,</u>	Verify locations of all floor openings, especially for multistoried buildings. Make
	sure they all line up where required (stairs, elevators, duct chases). Coordinate all floor openings, and roof openings between architectural, structural, and
	mechanical floor plans. Verify that all opening details are consistent.
	For roof plan verify all openings between architectural, structural, and mechanical
	plans. Check curb and flashing details. Check equipment support details
	between architectural, structural, and mechanical plans.
***************************************	For roof plan check locations of roof drains, downspouts, gutters on architectural and plumbing drawings. Check all details for water tightness. Check all roof
	details with specifications for correct materials installation methods.
	Coordinate reflected ceiling plan with mechanical and lighting plan to detect
	conflicts between supply/return air outlets and lighting fixtures.
	Check if ceiling is fire rated construction and verify details of openings to avoid
	compromising fire rated construction. Check specifications for ceiling materials and construction, specially fire rated construction, if any.
	Coordinate equipment layout with mechanical, plumbing, and electrical drawings
	to ascertain that proper utilities connections to equipment are provided.
	Coordinate equipment list with layout and specifications to ascertain that owner or
	government furnished items and contractor furnished items are clearly called out
	and that specifications are provided for contractor furnished equipment. Coordinate doors, windows, and louver schedules with doors and window details
	as well as symbols on plans and or elevations. Verify door opening size,
	materials, and swing for exit ways. Verify door opening size where large
	equipment and furnishings must move in/out. Verify materials of doors, windows,
	and hardware with specifications.
	Coordinate building elevations and sections between architectural, structural, and mechanical drawings for slab to slab, slab to roof height, and beam depth. Check
	top of slab, top of beam elevations between architectural and structural drawings.
	Coordinate between architectural, mechanical, and plumbing drawings for large
	duct and piping clearance. Check all through ceiling and through-wall details for
	ducts and pipes.
***************************************	Trace all major piping such as steam, sewer, fire protection water main and risers, as well a major duct works through the building to detect any major
	conflicts, interferences, and/or missing details.
	On building elevations, verify and locate all large pipes, ducts, air intake louvers,
	exhaust louvers, electrical cabinets, switchgear, service entrance masts, etc.
	Check mounting details, colors, and materials for unsightliness where buildings
	elevations are violated.
	Coordinate all partition locations and heights for proper details and conformity with fire rated construction and finish schedule. Verify with structural drawings for
	support and bracings where required.
	Where large glazing is shown on plans or sections, check fire rating of partition.
	Verify with specifications for correct materials and installation.

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with foundations.

Sanitary drain system pipes are sized and all fixtures are connected.

HVAC floor plans match architectural.

Verify applicability of all specifications sections. Remove non-applicable sections of references.

Verify utilities to mechanical systems and features:

- Power hook-up
- Drainage
- Light fixture placement

Provide gutters and downspouts

At all eaves

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		Above door openings only
		• None
		Is building drainage consistent with overall site drainage?
		Do buildings service entry points are with site/ utility drawings?
		Are floor drains located and coordinated with the architectural drawings?
		If internal roof drain leaders provided, are they located and coordinated with the
		architectural drawings?
		Are fire/smoke dampers located and coordinated with architectural drawings, and
		do ratings agree with Life Safety Plans?
	S	If motorized dampers provided have they been provided with electrical power?
		Has the ductwork layout been coordinated with structural and architectural
		drawings to verify that adequate clearance has been provided above ceilings?
		Have internal coordination drawings been developed overlaying the mechanical,
		electrical, plumbing and fire protection drawings to confirm that there are no
		conflicts?
		Has the mechanical diffuser layout been coordinated with the architectural
		reflected ceiling plans?
		Have the roof and wall penetrations, i.e., vents, louvers, etc. been coordinated
		with the architectural? Verify the size (free area) of louvers shown satisfies
		mechanical design requirements.
		Verify that roof top equipment and access/services requirements have been
		coordinated with the architectural roof plans.
		Has the appropriate service access been provided to the roof to service
		equipment?
		Has electrical services and access to water been provided for servicing roof top
		equipment?
		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
2	<u>lan Coordin</u>	ation Electrical (interface): (Lighting only) (By MEP) (Not this package
] Applicar	ole / [Not Applicable
		Use overlay light table process for full verification of all systems, avoiding errors,
		interferences and inconsistencies between drawings.
	NA	Electrical floor plans match architectural and mechanical. Check that location of
	14/11	floor mounted equipment is consistent between disciplines.
		Major pieces of equipment have electrical connections and that horsepower
		ratings, phases, and voltages are consistent with other discipline schedules.
		Locations of panel boards are consistent with architectural, mechanical, and
		plumbing floor plans and that panel boards are indicated on the electrical riser
		, ,
		diagram. Notes are referenced.
		Exterior electrical equipment locations are coordinated with site paving, grading,

		and landscaping.
		Verify that drawing and specification items provide power, wiring, and controls to
		all electrical equipment items.
		Foundation slabs for transformers and other electrical control equipment should
		be 6 inches higher than surrounding slab elevation.
		Verify site utilities and area lighting with civil and architectural drawings. Verify
		extent of night operation in determining pole lighting layout.
		Verify light patterns for special area lighting; check fixture mounting height,
		especially in exposed construction spaces, for possible interferences and for compliance with required clear usable height.

	Verify applicability of specifications sections; remove non-applicable sections of references. Verify mechanical equipment sizes and voltages with mechanical plans. Checking mechanical piping above electrical load centers for interference. Check that transformer sizes, wire and cable sizes are standard sizes and not special. Verify mechanical equipment layout on electrical plan with mechanical plan. Check for possible interference between electrical underground services and other utilities. Check to verify that all government or owner furnished equipment and all plumbing and mechanical work is shown as connected. Re-verify motor sizes at each submittal. Is lightning protection required by Code/Owner and if so, has it been shown on the drawings and provided with the proper grounding capabilities? Verify/Reconfirm electrical service requirements with equipment requirements listed in the Fixture/Equipment Schedules.
Plan Coordina	ation Landscape (Interface):
[X] Applicab	le / [] Not Applicable
X	Verify building planning for agreement with exterior paving, entries, required surface exposed utilities, equipment, roadway and parking areas and pedestrian walks. Check growth potential of planting, casting of shadows, leaf and debris droppings. Verify that planned irrigation systems and erosion control materials conform to soils report requirements.
Plan Coordina	ation Equipment:
[] Applicab	le / 🔀] Not Applicable
	The equipment layout matches other discipline floor plans and that there are no conflicts with columns. Equipment is connected to utility systems.
Interdisciplina	ry Plan Coordination:
[] Applicab	le / [X] Not Applicable
	Is the orientation for each building plan shown identically throughout? Check for interferences between new structures and: Existing Structures Mechanical Equipment Electrical Equipment Underground piping systems and other related equipment. Natural or existing as-built drainage patterns Paving Junk Contaminated Soil Recent Spoil/Embankments

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	Verify that all items referenced in the specifications as "As indicated" or "As shown" are in fact shown on the drawings. Confirm cross referenced sections or details to referenced drawing. Avoid "see Architectural plans" instead use "see A-11". Are the cross referenced sections or details correct and complete?
Plan Coordin	nation General Notes:
[X] Applical	ble / [] Not Applicable
N/A No	Verify that the items listed in the general notes appended to each technical guide specification are included on the drawings. Do the notes for Civil (C-1), Mechanical (M-1), Plumbing (P-1), Electrical (E-1), and Cathodic Protection (CP-1) drawings include the following: References to design criteria (not project specifications (MIL – HDBK, AISC, ACI, UBC, etc. Basic design data for each discipline.
	Delete notes that are shown but are not applicable to discipline scope of work.
X _N/A	Remove repetitions. Inspections, submittals and approvals are to be covered in the specifications only. Do not mention inspections, submittals and/or approvals on the drawings. On drawings for Federal Government clients use the term "Contracting Officer" instead of "Owner", "Architect" "Engineer" or other designation. The term "Contracting Officer" is the only one defined in most Federal Government contracts.
_X	Proprietary, experience, warranty, and "or-equal" clauses shall not be included on the drawings. They may be included in the specification only with Government contracts division approval. This approval must be obtained in writing prior to 100% design submittal. Coordinate material specifications on general notes with specifications Check for no proprietary product names on Government projects
Plan Coordin	nation Specifications:
[] Applical	ble / [] Not Applicable
	Have the specifications been reviewed against the basis of design? Does the text of the specification agree with the mark-up given to the prime? Check that bid items explicitly state what is intended Check specifications for phasing of construction. Provide a listing of all submittals Compare architectural finish schedule to specification index to assure called out finishes are specified.
	Check major items of equipment and verify that they are coordinated with contract drawings. Verify that the items specified "as indicated" or "where indicated" in the specifications are in fact indicated on the contract drawings. Verify that all specification sections are in the index and that cross referenced specification sections exist.
	Verify that thickness of materials or quantities of materials are not included in the specifications. (this should be shown on the plans)

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Has the requirement to coordinate with concurrent projects been appropriately addressed in the documents? Coordination and Checking Cost Estimate: [] Applicable / [X] Not Applicable Have we computed all of the project quantities? Do we understand were the quantity risk is? Design Quality Control Plan Page 28 Contract #W9126G-08-D-0048, Task Order #0002

FY2009 Warriors in Transition Barracks and Site

	Have we quantified the quantity risk?
	Is the cost data base used for the estimate from current local projects?
	Have we contacted contractors to confirm key aspects of the estimate?
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Does the project have unusual complexity?
***************************************	Have we appropriately quantified the cost effects of the complexity?
***************************************	Have we checked subconsultant estimates for reasonableness?
	Do we have other projects to compare subconsultant estimates against?
	Review all prior comments on the cost estimate. Review conference notes that
	affect the items reflected in the cost estimate. Verify that the estimate includes all
	of the items shown on the drawings and specifications or by note.
	Spot check for reasonable quality take offs.
	Highlight unit costs where regional fluctuations in labor, material costs or market
	conditions might occur.
	Review set-up costs, general administration costs, construction period escalation
	and construction time allotment for reasonableness.
	Check that additive bid items shown on drawings, in specification and estimate
	agree.
	Check that engineer's construction cost estimate is Lower than the contractual
	Estimated Construction Cost (ECC) (if applicable)
	Do we have a cost contingency or additive alternate bidding strategy?
	20 Wo have a cook contangency of additive another area ing characy,
Constructab	ility Review:
•	•
[] Applica	able / [X] Not Applicable
	7 •
	Verify that construction phases (if any) are clearly shown on the plans.
	Check sequencing of trades to make sure than can work on jobsite and leave for
	others to follow.
	Can it be built without sky hooks?
	Is the necessary sequence of construction reasonable?
	Is there enough space for the called out rebar so that congestion is reasonable?
	Is there sufficient access to tighten all the bolts shown?
	Are there sufficient locations for acceptable construction joints?
	•

END OF CIVIL DQC CHECKLIST

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APPENDIX 10 GEOTECHNICAL REPORT

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Geotechnical Engineering
Design Study
Fort Lewis
Warriors in Transition Barracks
Fort Lewis, Washington

Prepared for M.A. Mortenson

January 12, 2010 17597-00



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Geotechnical Engineering Design Study Fort Lewis Warriors in Transition Barracks Fort Lewis, Washington

Prepared for M.A. MORTENSON

January 12, 2010 17597-00

Prepared by **Hart Crowser, Inc.**

Matt Veenstra, PE Senior Staff

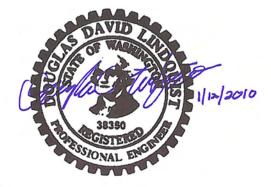
no la

Geotechnical Engineer

. Jeffrey Wagner, PE

Senior Principal

Seattle Regional Manager



Douglas D. Lindquist, PE, LEED

Senior Associate

Geotechnical Engineer

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EXISTING EXPLORATIONS AND LABORATORY RESULTS BY OTHERS

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GEOTECHNICAL ENGINEERING DESIGN STUDY FORT LEWIS WARRIORS IN TRANSITION BARRACKS FORT LEWIS, WASHINGTON

INTRODUCTION

This report presents our geotechnical engineering design recommendations for the proposed Warriors in Transition Barracks project (PN69224, FY2009) at Fort Lewis. We have organized this report into several sections. The first several pages provide an overview of the project information discussed in the text. The main body of the report presents our design recommendations and is followed by a Vicinity Map (Figure 1), Site and Exploration Plan (Figure 2), one attachment, and three appendices. Attachment 1 presents the test results of the on-site infiltration testing. Appendix A contains logs of one soil boring and two test pits performed for this project. Appendix B contains results of laboratory tests performed on selected soil samples. Appendix C contains boring logs and laboratory results of previously completed explorations by others in the project vicinity.

Our report includes the following sections:

- Project Understanding;
- Purpose, Scope, and Use of This Report;
- Subsurface Conditions;
- Geotechnical Engineering Design Recommendations;
- Recommendations for Additional Geotechnical Services; and
- References

PROJECT UNDERSTANDING

Our understanding of this project is based on:

- Our conversations and correspondence with TranSystems and Mortenson;
- The RFP Specs for the Warriors in Transition Barracks; and
- Preliminary geotechnical report titled "Draft Geotechnical Report Warrior in Transition Complex, Fort Lewis, Washington" by CivilTech Engineering, Inc. dated February 20, 2009 (CivilTech 2009).

We understand the project consists of design-build construction of the Warriors in Transition Barracks. We understand that this project consists of the design and construction of two structures no more than four stories in height and associated asphalt-paved parking areas.

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PURPOSE, SCOPE, AND USE OF THIS REPORT

Purpose

The purpose of this work was to assess the site surface and subsurface conditions in the vicinity of the proposed development area and provide geotechnical engineering recommendations relevant to design and construction.

Scope

Our geotechnical scope of work for this project includes the following major tasks:

- Review existing soil explorations by others;
- Perform Pilot Infiltration Tests (PITs) at two locations;
- Advance one boring near the proposed infiltration pond locations;
- Perform laboratory analysis (moisture content and grain size) of selected soil samples;
- Complete geotechnical engineering analysis including, but not limited to, recommended stripping depths of unsuitable soils (i.e., topsoil), foundation design, and pavement design;
- Prepare a final geotechnical engineering design report;
- Provide initial construction support including review of plans and specifications, and test pits for estimating stripping depths (pending); and
- Provide construction support (pending).

Use of This Report

Hart Crowser completed this work in general accordance with our contract dated November 13, 2009. We have performed this work for the exclusive use of TranSystems, M.A. Mortenson, and their design consultants for specific application to this project and site. We performed this work in accordance with generally accepted professional practices in the same or similar localities, related to the nature of the work accomplished, at the time the services were performed. No other warranty, express or implied, is made.

SITE CONDITIONS

The site is located at the intersection of Jackson Avenue and Gardner Loop Road. The site is bordered to the to the east by Fitzsimmons Drive, parking lots serving Madigan Hospital, and Madigan Hospital; to the north by a lawn area, and a parking lot serving Madigan Hospital; to the south by Jackson Avenue;

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and to the west by Madigan Child Development Center and landscaping (see Figures 1 and 2).

The eastern portion of the site, east of Gardner Loop Road, is currently occupied by landscaping and a parking lot for Madigan Hospital. The area west of Gardner Loop Road consists of a relatively level, grass-covered area with scattered trees.

SUBSURFACE CONDITIONS

Our understanding of the subsurface conditions is based on one 31.5-foot-deep boring, two Pilot Infiltration Tests (PITs), previous explorations performed in the site vicinity, and our experience at Fort Lewis. Logs to our soil boring and test pits are presented in Appendix A. Laboratory test results are presented in Appendix B. Previous explorations include eight soil borings completed by CivilTech Engineering, Inc. in 2009. Copies of the exploration logs and laboratory results for previous explorations are included in Appendix C.

Subsurface conditions interpreted from explorations at the discrete locations on the site and soil properties inferred from the field and laboratory tests formed the basis of our geotechnical recommendations contained in this report. The nature and extent of variations between explorations may not become evident until additional explorations are performed or construction begins. If variations are encountered, it may be necessary to reevaluate the recommendations made within this report.

Soils

The near-surface soil conditions differ between the sites located to the east and west of Gardner Loop Road. In general, the site soils consist of:

East of Gardner Loop Road

Based upon the explorations by CivilTech Engineering and Hart Crowser, the soils east of Gardner Loop Road consist of medium dense to very dense, recessional outwash sand and gravel with trace to some silt. Fill soils are present locally to depths of about 2.5 feet and consist of medium dense, mixed sand, gravel and topsoil.

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West of Gardner Loop Road

Explorations west of Gardner Loop Road encountered Fill soils down to about 7 to 8 feet below ground surface. The Fill soils consist of loose to medium dense, mixed sand, gravel and topsoil overlain by about one-half to one foot of sod and topsoil. The Fill is underlain by medium dense to very dense, recessional outwash sand and gravel with trace to some silt.

Groundwater

The CivilTech boring logs do not indicate groundwater in any of their borings to 15.5 feet below ground surface. Hart Crowser boring WIT-B-1 encountered groundwater at about 19 to 21 feet below ground surface during drilling (about elevation 257.5 to 259.5 feet, NAVD 88).

The depth to the groundwater table will be used in evaluation of on-site infiltration systems. It is important to note that groundwater observations are taken at the specific time noted herein and that groundwater levels may fluctuate due to seasonal changes, rainfall, temperature, and other factors.

Corrosivity Conditions

Corrosivity testing was performed for the baseline geotechnical report. The results are presented in Table 1. The results of the corrosivity testing indicate that the soils are "mildly corrosive." For additional results and discussion regarding the corrosivity of on-site soils the reader is referred to the baseline geotechnical report. (CivilTech, 2009).

Table 1 - Corrosivity Test Results for On-Site Soils

Soil Sample	Depth	рН	Electrical Resistivity	Sulfate Content
	in Feet		(ohm-cm)	in ppm
B-1 S-2	2.5	6.92	42,000	10.7
B-1 S-4	9	6.95	47,800	8.49
B-2 S-1	1	6.11	48,500	48.2
B-2 S-3	4	6.72	37,900	38.2
B-2 S-4	9	6.57	75,200	
B-3 S-1	1	5.53	21,300	77.7
B-3 S-3	4	6.04	20,000	13.9
B-3 S-4	9	6.31	65,800	
B-4 S-2	2.5	7.09	62,500	4.93
B-4 S-4	9	7.20	68,500	7.26
B-6 S-1	1	6.31	67,100	12.1

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B-6 S-3	4	6.53	32,900	6.86
B-6 S-4	9	7.59	22,300	1
B-7 S-2	2.5	6.33	40,600	14.6

GEOTECHNICAL ENGINEERING CONCLUSIONS AND RECOMMENDATIONS

This section of the report presents our geotechnical engineering conclusions and recommendations for the design and construction of the proposed structures and pavement areas. We have developed these recommendations based on the typical soil and groundwater characteristics, as described previously.

Site Preparation

Site preparation will involve the removal of some existing pavement (asphalt and/or concrete) sections. We recommend that the removed asphalt and concrete not be reused as structural fill below new foundation elements for the proposed structures. However, crushed asphalt and concrete may be reused as road sub-base material for the new pavement sections, provided that placement of these materials is acceptable under the rules and regulations of the Fort Lewis Army Base. Based on meetings with the US Army Corps of Engineers on previous projects, we understand reuse of this material is encouraged. Refer to the **Design of Asphalt Pavement** section of this report for additional recommendations regarding the reuse of crushed asphalt and concrete as road sub-base material.

If existing structures will be demolished during site preparation, we recommend the foundation elements of the demolished structures be removed and any existing underground utilities within the new structure areas also be removed or properly abandoned. Abandoned underground utilities that are not removed should be completely grouted. Ends of remaining abandoned utility lines should be sealed to prevent piping of soil or water through those lines.

Site preparation for the proposed structures and pavement areas should also consist of removal of any surface vegetation and organic soil. We have observed that the site is generally covered by a layer of topsoil containing high percentages of silt and organic material (i.e., grass and roots), which do not provide a suitable subgrade for shallow foundations or pavement sections. The thickness of this layer varies from no material in developed areas of the site to about 1 to 2-1/2 feet in undeveloped portions of the site east of Gardner Loop Road. We recommend that the topsoil be removed as part of the site preparation activities below structures. It is important to note that the topsoil layer grades to a more competent subgrade with depth, which includes an

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increasing percentage of gravel and decreasing percentage of fine-grained particles (i.e., silt) and organic material, although the color of the soil may not change between the surficial topsoil and upper portions of the underlying more competent soil.

We anticipate that the depth of necessary stripping will vary across the site depending on the intended use of particular areas and on the specific depth of unsuitable soils in those locations. For example, areas where building foundations are located will require removal of all unsuitable soils, while less stripping may be necessary under lightly loaded pavement sections because of their greater tolerance for differential settlement.

Because of the variations in subsurface conditions and planned construction uses throughout the site, we do not recommend that a single stripping depth be specified for the entire site. Doing so would likely involve removing more material than necessary in some areas and ultimately lead to an increase in construction cost.

We have found through our previous experience at nearby sites and on other projects with similar soil conditions that the most cost-effective designs are those that allow for flexibility to make stripping depth decisions in the field as construction progresses. We strongly recommend AGAINST using color of the material as an indication of what thickness of material will need to be stripped. In our experience, this approach generally leads to a greater amount of stripping than is necessary to provide good support.

Recommendation. To assist in planning for the amount of stripping required for this site we recommend performing initial construction support that includes one to two days of shallow test pits for determination of stripping depths. Furthermore, we recommend that a Hart Crowser geotechnical representative be on site during construction to make recommendations to the contractor about stripping depths and subgrade compaction to assess the stripping of unsuitable soils. We have found that proofrolling the subgrade is a good way to observe the suitability of the subgrade soils.

Temporary Cut Slope

We understand that open cutting may be performed as part of the construction activity associated with this project. The stability and safety of cut slopes depend on a number of factors, including:

■ The type and density of the soil;

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- The presence and amount of any seepage;
- Depth of cut;
- Proximity of the cut to any surcharge loads near the top of the cut, such as stockpiled material, traffic loads, structures, etc., and the magnitude of these surcharges;
- Duration of the open excavation; and
- Care and methods used by the contractor.

Based on these factors, we make the following recommendations regarding open cuts:

- Use plastic sheeting to protect slopes from erosion; and
- Limit the maximum duration of the open excavation to the shortest time period possible.

Because of the variables involved, actual slope grades required for stability in temporary cut areas can only be estimated prior to construction. We recommend that stability of the temporary slopes used for construction be the sole responsibility of the contractor, since the contractor is in control of the construction operation and is continuously at the site to observe the nature and condition of the subsurface. Excavations should be made in accordance with all local, state, and federal safety requirements.

Foundation Support

The proposed buildings can be supported on shallow spread footings. This section includes our recommendations for vertical foundation support, lateral foundation support, and construction considerations.

Vertical Foundation Support

Continuous and isolated spread footings may bear on the native medium dense to very dense sand and gravel or structural fill compacted to 95 percent of modified Proctor bearing on the native medium dense to very dense sand and gravel. Some stripping of the surficial topsoil layer will likely be necessary to expose acceptable foundation soils.

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■ Use a maximum allowable bearing pressure of 4 kips per square foot (ksf) for shallow footings bearing on materials described in this section.

- Isolated spread and continuous (i.e., strip) footings should have a minimum width of 2.5 and 1.5 feet, respectively.
- Interior spread footings should bear a minimum of 12 inches below adjacent slab-on-grade;
- Exterior spread footings and perimeter strip footings should bear a minimum of 18 inches below adjacent grade;
- Allowable soil bearing pressures may be increased by up to one-third for loads of short duration, such as those caused by wind or seismic forces.

Foundation Modulus of Subgrade Reaction. For static loading conditions, we recommend using of a vertical modulus of subgrade reaction (K_{V1}) of 250 pounds per cubic inch (pci) for shallow foundations and slabs-on-grade bearing on the medium dense to dense sand and gravel or structural fill. Note that K_{V1} is provided for a 1-foot by 1-foot vertically loaded plate. Subgrade moduli decrease with increasing area of a foundation element. Therefore, the subgrade modulus will need to be reduced based on the actual dimensions of the foundation modeled. Although many formulas exist to calculate the reduced subgrade modulus, final determination of the subgrade modulus value to be used will depend on the following:

- The structural and geotechnical engineer's experience designing similar foundations in similar soil conditions;
- The quantity, loading, and area of the footings; and
- Back-checking settlement predicted from structural modeling with geotechnical settlement estimates for given foundation geometries.

We recommend that the initial subgrade moduli estimation for individual foundations elements (K_s) be calculated using the following equation:

$$K_S = K_{V1} (B+1)^2/(4B^2)$$

Where B = foundation width in feet.

The structural engineer should consider the K_s value as a starting point for an iterative design process. Hart Crowser should review the displacement

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estimates from the structural model and perform settlement evaluations of the specific geometry and loading for compatibility. Based on these settlement evaluations, modifications to the modulus of subgrade reaction used in the structural model may be required.

Settlement. We expect the native load-bearing soil, and structural fill to generally behave elastically, with settlement occurring as the design loads are applied or shortly thereafter. We understand that the column loads are on the order of 100 kips or less. Based on these values and our allowable bearing pressures, we estimate that settlement of shallow footings constructed on bearing soils as described herein will be less than about 1 inch. Based on variations in subsurface soil conditions and construction practice across a particular structure, we estimate that differential settlement between adjacent footings could be approximately one-half of the total settlement.

Lateral Foundation Support

Resistance to lateral loads is obtained from shallow footings using passive resistance against the side of the footings and/or frictional resistance along the base of the footing. We make the following recommendations for lateral foundation support:

- Use an allowable passive equivalent fluid density of 300 pounds per cubic foot (pcf) with a triangular pressure distribution for footings placed adjacent to a neat cut within the native medium dense to very dense sand and gravel or compacted structural fill. A factor of safety of 1.5 has been applied to this recommendation.
- Neglect the passive resistance of the upper 2 feet of soil to account for potential soil disturbance.
- Use an allowable coefficient of friction to resist sliding equal of 0.35 for footings poured neatly on the granular structural fill or the native medium dense to very dense sand and gravel. A factor of safety of 1.5 has been applied to this recommendation.

Construction Considerations

The estimated foundation settlement assumes that careful preparation and protection of the exposed subgrade will occur prior to concrete placement as discussed herein. Any loosening of the materials during construction could result in larger settlement. It is important that foundation excavations be

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cleaned of loose or disturbed soil prior to placing any concrete and that there be no standing water in any foundation excavation.

- It may be necessary to locally overexcavate beneath individual footings to expose the acceptable bearing soil layer. Localized overexcavation may be required if unacceptable soil conditions (i.e., loose, wet, or organic soils) are observed below the proposed base of the footing during construction. If overexcavation beneath footings is necessary, backfill the overexcavated zone with structural fill placed in accordance with the recommendations in the *Structural Fill* section of this report.
- Where structural fill is used to replace the overexcavated material, the overexcavation, at a minimum, should extend outward and downward from the outer edges of the footing to the bearing layer at an angle no steeper than 1 horizontal to 1 vertical (1H:1V). For example, a 4-foot by 4-foot footing with 2 feet of overexcavation will require an 8-foot by 8-foot bearing area at the base of the overexcavation.
- Footings should be founded outside of an imaginary 1H:1V plane projected upward from the bottom edge of adjacent footings or utility trenches.
- Have Hart Crowser observe and document exposed subgrades before foundation construction.

If the foundation excavations are to be left open for any length of time (more than a few hours) or if there is a chance of disturbance from construction activities or water infiltration, we recommend the excavations be protected by one of the following methods:

- Excavating to near finished subgrade elevation, then immediately prior to placement of steel and concrete, remove disturbed soil to establish final grades; or
- Placing a nominal 2- to 4-inch-thick "mud mat" consisting of lean concrete at the bottom of the footing excavations. This should be completed immediately after the excavation has been checked and approved by a qualified geotechnical engineer or geologist.

Lateral Pressure on Permanent Subgrade Walls

We understand that subgrade walls backfilled on one side only may be used in some areas of the site. For compacted structural fill, compute the active and atrest pressures using an equivalent fluid unit weight for the soil equal to 35 and

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55 pcf respectively. These values are based on a drained condition behind the walls so there is no build-up of hydrostatic pressure. The use of active pressure is appropriate if the subgrade wall is allowed to yield a minimum 0.001 times the height of the wall. For a non-yielding wall, at-rest conditions should be used. An appropriate allowable passive equivalent fluid unit weight for this material is 300 pcf. A factor of safety of 1.5 has been incorporated into the resistance side (i.e., the passive pressure and coefficient of friction) of these recommendations.

Floor Slab Design

Floor slabs can be designed as slab-on-grade structures above a free-draining capillary break drainage layer and native medium dense to very dense, sandy Gravel or structural fill. Note that in some areas of the site, the underlying clean native sand and gravel may suffice as a "capillary break." This should be assessed during construction. Do not construct near-grade floor slabs directly on the existing topsoil or other loose fill soils. Unsuitable soils must be overexcavated and replaced with compacted structural fill.

We recommend that slabs-on-grade be constructed on a minimum thickness of 12 inches of dense material. This 12-inch zone can consist of:

- Dense to very dense native material;
- Densely compacted structural fill;
- Native loose material that is compacted to a dense condition; or
- A combination of the above.

As part of this 12-inch zone, we recommend that the upper 4 inches consist of free-draining material (less than 3 percent fines based on minus 3/4-inch fraction) to serve as a capillary break layer. On-site soils that meet the criteria may be used as this capillary break material. This layer is intended to reduce the potential for moisture migrating up through the slab.

For the design and construction of slab-on-grade floors, we recommend the following:

- Compact the drainage layer to the criteria discussed in the **Structural Fill** section of this report.
- Use a modulus of subgrade reaction of 250 pci for design of floor slabs on the medium dense to very dense native sandy gravel, and/or compacted

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structural fill (see commentary on modulus of subgrade reaction in **Vertical Foundation Support** section); and

 Perform a grain size analysis on any soil that is proposed as capillary break material. Hart Crowser can perform the gradational analysis if it is not available from the material source.

Following excavation and footing construction, the proposed slab-on-grade areas should be visually inspected by Hart Crowser to determine whether loosening of the soil near the ground surface has occurred. If loose areas are observed, they should be recompacted or removed and replaced to provide a dense, non-yielding surface for the placement of the drainage layer and slab-on-grade. We recommend proof rolling the subgrade area for slabs-on-grade with a heavy vibratory roller or fully loaded dump truck.

Structural fill should be placed only after the unsuitable soils have been removed and the exposed subgrade compacted in place to a dense condition. Hart Crowser should assess the suitability of the subgrade during construction.

Drainage Recommendations

In this section, free-draining material is defined as a sand and/or gravel with less than 3 percent fines based on the minus 3/4-inch fraction of the material.

Slabs-on-Grade

We recommend a capillary break layer typically consisting of at least 4 inches of free-draining material below slabs-on-grade. This 4-inch-thick drainage layer may be composed of the non-silty portions of the on-site native sandy gravel as deemed acceptable by a qualified geotechnical engineer or geologist.

Backfilled Walls

Walls with soil backfilled on only one side will require drainage or they must be designed for full hydrostatic pressure. We recommend the following:

- Backfill with a minimum thickness of 18 inches of free-draining sand or sand and gravel that is well-graded (i.e., has a wide range in particle size).
- Install drains behind any backfilled subgrade walls. The drains, with cleanouts, should consist of minimum 4-inch-diameter perforated pipe and placed on a bed of, and surrounded by, 6 inches of free-draining sand or

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sand and gravel. The drains should be sloped to carry the water to a sump or other suitable discharge.

■ The backfill should be continuous and envelop the drainage behind the wall.

Final Site Drainage

The site should be graded in such a way that surface water will not pond near the structures. Roof drains should not be connected to the subgrade drainage system and should be sloped and tightlined to a suitable outlet away from the proposed building.

Pavement Areas

The pavement areas should be graded in such a way that surface water will not pond and will drain to a suitable outlet.

Site Infiltration

We understand that bio-infiltration swales and infiltration ponds will be constructed at the site for disposing of stormwater. Attachment 1 presents the results of two Pilot Infiltration Tests at the site. The results of these tests are specific to the soil conditions at specific depths below the ground surface and the water depth used in the test. Based on these test results, we provide recommended infiltration rates in Attachment 1.

Utility Design

Utility trench cut design should generally be the responsibility of the contractor. For shallow trench excavations (up to 4 feet in depth), open cutting may be used provided there is adequate stability of the side walls. Use of trench boxes may be necessary for unstable side wall conditions or if deeper excavations are required for placement of utilities. The contractor should verify the conditions of the side slopes during construction and slope back trench cuts as necessary to conform to current Standards of Practice and safety requirements.

Our recommendations for bedding and trench backfill materials are presented below. The minimum dry densities recommended below are a percentage of the modified Proctor maximum dry density as determined by the ASTM D 1557 test procedure.

 At least 4 inches of bedding is recommended for all utility pipes. We recommend that bedding materials consist of well-graded sand and gravel

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with less than 3 percent material passing the number 200 sieve (based on the minus 3/4-inch fraction). Bedding material should be compacted with care not to damage the utility pipes.

- The recommended bedding backfill materials can be used as backfill around the pipe utilities (pipe zone backfill). Pipe zone backfill should extend to at least the top of the pipe.
- For bedding material beneath catch basins and manholes, we recommend at least 6 inches of imported structural fill (or acceptable on-site material) that consists of well-graded sand and gravel with less than 3 percent passing the number 200 sieve (based on the minus 3/4-inch fraction). The bedding material should be compacted to at least 90 percent modified Proctor maximum dry density.

Structural Fill

Soils placed beneath structures, surrounding utilities, or below paved areas should be considered Structural Fill. In these fill areas, we recommend the following:

- Structural fill should only be placed on a dense and non-yielding subgrade.
- For imported soil to be used as structural fill, we recommend using a clean, well-graded sand or sand and gravel with less than 5 percent by weight passing the No. 200 mesh sieve (based on the minus 3/4-inch fraction) for grading in wet conditions. Compaction of material containing more than about 5 percent fine material may be difficult if the material is wet or becomes wet. During dry grading conditions, the fines content may be increased provided that the soil is compacted near its optimum moisture content.
- Place and compact all structural fill in lifts with a loose thickness no greater than 10 inches. If small, hand-operated compaction equipment is used to compact structural fill, fill lifts should not exceed 6 inches in loose thickness.
- Control the moisture content of the fill to within 2 percent of the optimum moisture. Optimum moisture is the moisture content corresponding to the maximum modified Proctor dry density.
- In areas of general site filling, compact structural fill to a minimum of 90 percent below an elevation corresponding to 2 feet below final subgrade. Below all structures and/or within 2 feet of final subgrade, the compaction

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requirement should be at least 95 percent. The minimum dry densities recommended here are a percentage of the modified Proctor maximum dry density as determined by the ASTM D 1557 test procedure.

- If wet subgrade areas are encountered during foundation or pavement section preparation, clean material with a gravel content (material coarser than a U.S. No. 4 sieve) of at least 30 to 35 percent may be necessary.
- The compacted densities of each lift should be verified by a qualified geotechnical engineer or engineering geologist.

Before fill control can begin, the compaction characteristics must be determined from representative samples of the structural and drainage fill. Samples should be obtained as soon as possible. A study of compaction characteristics should include determination of optimum and natural moisture contents, maximum dry density, and gradation of these soils.

Use of On-Site Soils as Structural Fill

The suitability of excavated site soils for use as compacted structural fill depends on the gradation and moisture content of the soil when it is placed. As the amount of fines (that portion passing the No. 200 sieve) increases, the soil becomes increasingly sensitive to small changes in moisture content and adequate compaction becomes more difficult to achieve. Soil containing more than about 5 percent fines cannot be consistently compacted to a dense non-yielding condition when the water content is greater than about 2 percent above or below optimum. Reusable soil must also be free of organic and other compressible material.

Surficial Topsoil. We recommend that the surficial layer of topsoil **not** be used as structural fill. This material likely contains significantly more than 5 percent fines and, therefore, will be moisture-sensitive during periods of wet weather. In addition, it contains organic matter that could lead to long-term settlement as that matter breaks down over time. Therefore, the surficial layer of topsoil should not be used for structural fill. Surficial topsoil or other native soil may be used in landscaped areas provided that it can be compacted to a reasonable degree with construction equipment.

Native Medium Dense to Very Dense Sand and Gravel. Results of our laboratory analysis indicate that the soils underlying the topsoil layer generally contain a small percentage of fine-grained particles and may be suitable for use as structural fill. However, some of the soil located directly below the topsoil layer may have a fines content that is great enough to make it moisture-sensitive

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when wet. It is more likely that these soils could be used as fill during the drier summer construction season, especially on a large site such as this where the material can be aerated using dozers or agricultural discs. During periods of wet weather, it will be more difficult to use these materials. Earthwork operations would need to be scheduled to work during periods of dry weather so as to keep the moisture content of the material near its optimum level.

Recycled Pavement. We understand that the US Army Corps of Engineers encourages reuse of pavement on site. The contractor may plan to use portions of demolished pavement sections (taken from existing pavement areas at the site) as subgrade material below the proposed base course and new pavement sections. We understand asphalt could be pulverized, including a portion of the existing base course material to create a new composite material for reuse. In general, we consider the reuse of this material to be acceptable provided the following conditions are met:

- The recycled asphalt and concrete pavement material is free of organic material:
- The material is pulverized so that no pieces are larger than 4 inches;
- It is mixed with sand and gravel base course or structural fill; and
- Placement of the recycled material does not violate any regulations that exist regarding reuse of non-natural material as structural fill at Fort Lewis.

If recycled asphalt and concrete are desired to be used, we recommend that samples of the pulverized, recycled material be submitted to Hart Crowser for testing. We can perform California Bearing Ratio (CBR) and moisture density (modified Proctor) tests on the material to evaluate its suitability as subgrade material.

If the contractor plans to use recycled portions of the existing pavement sections, the material should be used under proposed new pavement areas only. Recycled asphalt and pavement should not be used as structural fill under new building foundation elements such as footings or slabs-on-grade.

Design Pavement Sections

In this section we provide soil and pavement recommendations for asphalt (flexible) and concrete (rigid) pavement design. We make the following recommendations for pavement design:

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Pavement sections should be constructed over a subgrade surface consisting of either non-yielding compacted native soils or compacted structural fill. It has been our experience that overexcavation of near-surface soft soils and proof rolling of the exposed subgrade surface prior to pavement construction works well.

- Existing fill should be recompacted in place to a dense condition;
- For flexible pavement use a resilient modulus (Mr) of 22,500 pounds per square inch (psi) for native subgrade materials compacted to at least 95 percent of the maximum modified Proctor dry density;
- For rigid pavement use a modulus of subgrade reaction of 260 pounds per cubic inch (pci) for native subgrade materials compacted to at least 95 percent of the maximum modified Proctor dry density;
- See **Site Preparation** section for additional recommendations
- Hart Crowser should observe proof rolling of the pavement subgrades to confirm that a firm and non-yielding surface exists for pavement support.

Pavement Design Calculations

Here we present the input and results of our pavement design calculations. Input related to both the asphalt and concrete calculations is shown below followed by specifics of each analysis.

Design input parameters as required in 1993 AASHTO Guide for Design of Pavement Structures and Supplements are summarized as follows:

- **Design Life:** 25 years
- **Design Equivalent Single Axle Loads (ESALs):** Not specified in Request for Proposal.
- **Reliability Value:** 85 to 90 percent for the site
- Combined Standard Error of Traffic Prediction and Performance Prediction: 0.5
- Initial and Terminal Serviceability Index: 4.5 and 3.0, respectively

Asphalt Pavement

Additional input to and the results of our example asphalt pavement design are shown below.

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■ Layer Coefficients: 0.44 for Hot-Mix Asphalt (HMA) and 0.13 for Crushed Surfacing Base Course (CSBC).

■ **Drainage Coefficient:** 1.0

■ **Resilient Modulus:** 28,000 psi for CSBC, 22,500 psi for subgrade based on soil type, stiffness, and CBR described herein

Because traffic loads/volumes are not specified in the RFP we provide the results of a parametric study for an assumed range of ESALs in Table 2.

Table 2 - Flexible Pavement Recommendations

			Range o	f ESALs
Reliability	Base Material Thickness	Asphalt Thickness	Max of bounding ESAL	Min of bounding ESAL
85	6 inches CSBC	2 inches	10,000	N/A
90	6 inches CSBC	2 inches	8,000	N/A
85	6 inches CSBC	3 inches	76,000	34,000
90	6 inches CSBC	3 inches	57,000	26,000

It is important to note that these pavement section recommendations assume that the subgrade material surface is properly prepared and that crushed rock or recycled asphalt and concrete is compacted to the degree recommended herein for **Structural Fill**. Also, the project RFP requires that "the minimum flexible pavement section shall consist of 2 inches of asphalt and 6 inches of base..." (USACE, 2009). We could provide revised recommendations for the pavement section if more specific traffic load data are provided to us.

Concrete Pavement

Additional input to and the results of our example concrete pavement design are shown below.

- **Elastic Modulus:** 4,000,000 psi for Portland Cement Concrete
- Modulus of Rupture: 663 psi for Portland Cement Concrete
- **Drainage Factor:** 1
- Load Transfer Coefficient: 3.2
- Modulus of Subgrade Reaction: 260 pci for combined base course and subgrade based on soil type, stiffness, and degradation.

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Based on AASHTO 1993, Table 3 presents our concrete pavement recommendations for design of new rigid pavements subjected to the loading shown. Lighter loading would allow for a thinner pavement section.

Table 3 - Rigid Pavement Recommendations

			Range o	f ESALs
Reliability	Base Material Thickness	PCCP Thickness	Max of bounding ESAL	Min of bounding ESAL
85	6 inches CSBC	4 inches	107,000	68,000
85	6 inches CSBC	5 inches	260,000	170,000
85	6 inches CSBC	6 inches	570,000	410,000
90	6 inches CSBC	4 inches	85,000	55,000
90	6 inches CSBC	5 inches	210,000	140,000
90	6 inches CSBC	6 inches	450,000	320,000

These pavement section recommendations assume that the subgrade material surface is properly prepared and that crushed rock or recycled asphalt and concrete is compacted to the degree recommended herein for **Structural Fill**. We could provide revised recommendations for the pavement section if more specific traffic load data are provided to us.

Seismic Considerations

The site is located in a seismically active area. In this section, we describe the seismic setting at the project site, provide recommendations to develop the code-based design response spectrum, and discuss seismic-induced geotechnical hazards.

Seismic Setting

The seismicity of western Washington is dominated by the existence of the Cascadia Subduction Zone (CSZ) in which the offshore Juan de Fuca plate is subducting beneath the continental North American plate. Three main types of earthquakes are typically associated with subduction zone environments—crustal, intraplate, and interplate earthquakes. Seismic records in the Puget Sound area clearly indicate the existence of a distinct shallow zone of crustal seismicity (e.g., the Tacoma Fault) that may have surficial expressions and can extend to depths of up to 25 to 30 km (15 to 18 miles). A deeper zone is associated with the subducting Juan de Fuca plate and produces intraplate earthquakes at depths of 40 to 70 km (24 to 42 miles) beneath the Puget Sound region (e.g., the 1949, 1965, and 2001 earthquakes) and interplate earthquakes

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at shallow depths near the Washington coast (e.g., the 1700 earthquake with an approximate magnitude of 9.0).

Code-Based Design Response Spectrum

We understand that the seismic design of this project will be performed in accordance with the 2006 International Building Code (IBC). The basis of design for this code is two-thirds of the hazard associated with an earthquake with 2 percent probability of exceedance in a 50-year window of time, which corresponds to an average return period of 2,475 years. We obtained the seismic hazard from the United States Geologic Survey 2002 National Seismic Hazard Maps for Latitude 47.131 and Longitude –122.613. Below, we provide parameters for seismic design in accordance with this code.

- Maximum Considered Earthquake Spectral Response Acceleration at Short Periods, S_s = 1.186 g;
- Maximum Considered Earthquake Spectral Response Acceleration at Periods of One Second, $S_1 = 0.417$ g; and
- Site Class C.

Seismically Induced Geotechnical Hazards

Potential seismic-induced geotechnical hazards at the project site include surface rupture, liquefaction and subsidence, lateral spreading, and landslides. Our review of these hazards is based on the existing soil explorations presented in this report, regional experience, and our knowledge of local seismicity.

Surface Rupture. Fort Lewis lies in between the Tacoma Fault Zone and the Olympia Fault. Because there are not any known faults underlying the site, the hazard associated with surface rupture at the site during the structure's design life is very low.

Liquefaction and Subsidence. When cyclic loading occurs during a seismic event, the shaking can increase the pore pressure in saturated loose to medium dense granular materials and cause liquefaction, or temporary loss of soil strength. This can lead to surface settlement. We expect that this site will not be susceptible to liquefaction-induced settlement because of the dense condition of the soils at and below the observed groundwater table. It cannot be said with any certainty what soil and groundwater conditions may exist beyond the extent of these exploration locations; however, it is likely that the soils below that depth will either be too dense to liquefy or not cause

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widespread surficial settlement. The risk of liquefaction, seismic-induced settlement, or significant ground deformation as a result of liquefaction from the design earthquakes is low.

Lateral Spreading. Lateral spreading is typically associated with lateral movement on sloping ground caused by liquefaction or a reduction of shear strength of soils within or under the slope. Because the liquefaction hazard is low, the lateral spreading hazard is also low.

Landslides. Based on the subsurface condition, site location, minimal slope inclination, and lack of reported landslides in the vicinity, the landslide hazard is considered low.

RECOMMENDATIONS FOR ADDITIONAL GEOTECHNICAL SERVICES

Design Services

Before construction begins, we recommend that Hart Crowser be retained to review geotechnical aspects of the final design plans and specifications to see that our recommendations have been properly interpreted and implemented into the design. The recommendations presented in this report may need to be reviewed and modified or verified in the event the project elements differ from the assumptions presented herein. We will be available to discuss these issues with the design team as the design develops and as needed.

Construction Services

During the construction phase of the project, we recommend that Hart Crowser review the contractor submittals and provide a representative to observe the following:

- Observe test pits by the earthwork contractor to calibrate them on necessary stripping depths;
- Site preparation activities including topsoil stripping and grading;
- Placement and compaction of structural fill including testing of proposed fill materials and subgrades prior to placement of the fill;
- Excavation and placement of foundations and slabs-on-grade;
- Drainage elements;

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 Preparation of pavement subgrades including use of recycled asphalt and concrete pavement sections; and

 Other geotechnical considerations that may arise during the course of construction.

The purpose of these observations is to determine compliance with the design concepts, specifications, or recommendations and to allow for timely design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

REFERENCES

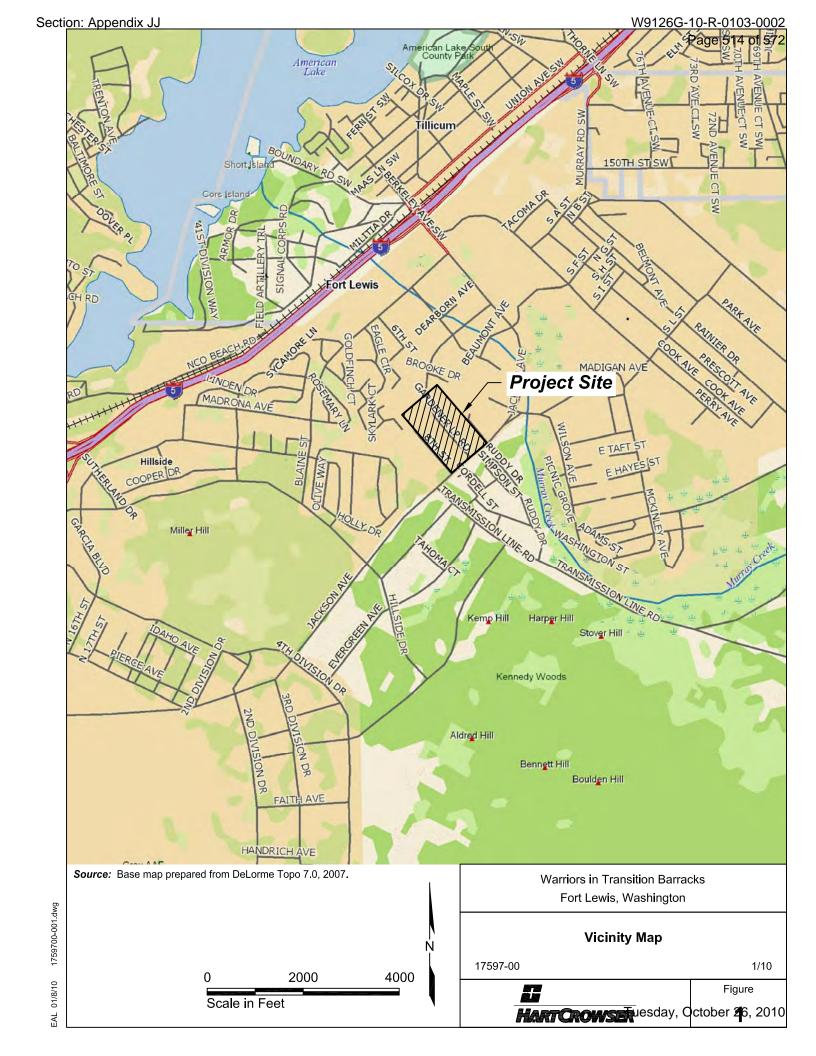
American Association of State Highway and Transportation Officials (AASHTO) (1993). AASHTO Guide for Design of Pavement Structures and Supplements.

CivilTech Engineering, Inc. (2009). Draft Geotechnical Report, Warrior in Transition Complex, Fort Lewis, Washington, February 20, 2009.

International Code Council (2006). International Building Code.

US Army Corps of Engineers (2009). Design-Build Request for Proposal, Warriors in Transition Barracks, PN69224, FY2009, July 2009.

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ATTACHMENT 1
SITE-SPECIFIC INFILTRATION TESTS

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www.hartcrowser.com



MEMORANDUM

DATE:

January 12, 2010

BY:

Angie Goodwin, Senior Staff Hydrogeologist

Roy Jensen, LHG, Senior Hydrogeologist

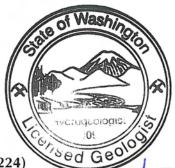
RE:

Site-Specific Infiltration Tests

Warriors in Transition Barracks (FY 2009, PN69224)

Fort Lewis, Washington

17597-00



Roy E. Jensen

Hart Crowser performed Pilot Infiltration Test (PIT) type infiltration tests (Ecology 2005) to support the construction project at the Warriors in Transition Barracks in Fort Lewis, Washington. The purpose of the infiltration test was to determine the infiltration rate for the design of stormwater infiltration facilities.

The infiltration rate obtained from infiltration testing should be considered a short-term infiltration rate. Short-term infiltration rates are typically adjusted through correction factors to account for site variability, number of tests conducted, degree of long-term maintenance and influent pretreatment/control, and potential for long-term clogging due to siltation and bio-buildup. The infiltration test procedures and correction factors are generally based on the recommendations provided in the 2005 Western Washington Stormwater Manual (Ecology 2005).

BACKGROUND

We understand that the project will use infiltration basins for the treatment and disposal of stormwater runoff. The infiltration system will include a series of two basins. The first basin will be lined with sod and connect to a second basin which will be open to the native soil.

The shallow geology of the study area as observed in test pit excavations and soil borings typically consists of two units, Fill and glacial outwash deposits. The Fill unit consists of sod over organic silty gravel or sand and/or organic gravelly silt. Underlying the Fill unit is Vashon Drift consisting primarily of coarse, sandy gravels deposited as glacial recessional outwash (Borden and Troost 2001). The outwash gravels contain a high percentage of cobbles up to 12-inches in diameter with

Tel 206.324.9530

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WIT Barracks, Fort Lewis
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occasional boulders. In the Fort Lewis area, the glacial outwash unit is reported to be as thick as 200 feet or more.

Soil explorations for this study consist of one boring drilled to a depth of 31.5 feet and two test pits excavated to depths of 8.5 and 10.5 feet. The water table was encountered in soil boring (WIT-B-1), at a depth of 19 to 21 feet.

TEST RESULTS

Two PIT-type infiltration tests were completed at the site on January 4 and 5, 2010. The location of the test pits are shown on Figure 2 of the accompanying geotechnical report (Hart Crowser 2010). The test pits were completed using an excavator. A plywood shoring system was placed in the test pit to maintain side wall stability during the test and to prevent contamination (i.e., clogging) of the PIT base by finer grained side wall soils. Water was supplied from a nearby fire hydrant. The dimensions of the base of the test pits were approximately 5 feet by 5 feet wide. The results of the infiltration tests are summarized herein and presented in Table 1.

WIT-PIT-1

- The bottom of WIT-PIT-1 was located at an approximate depth of 8.5 feet. Sixteen inches of sand overlain by 2 inches of sod were placed in the bottom of the test pit to simulate the infiltration conditions using the proposed construction materials.
- The ground surface at the test pit location is approximately 276 feet based on survey data provided by the contractor.
- Soils observed in the test pit included 4 inches of sod over very sandy Gravels with abundant cobbles to a depth of 8.5 feet.
- WIT-PIT-1 infiltration test was conducted on January 5, 2010 for nearly 9.5 hours starting at about 7:30 AM and was completed at 5:00 PM. The total cumulative volume of water added during the test was approximately 14,330 gallons.
- Water was added to the test pit until steady state flow was achieved. The steady state flow rate for WIT-PIT-1 was 26 gallons per minutes (gpm). At steady state flow, the constant head maintained above the test pit bottom was approximately 0.57 feet. The recovery test, after the flow was turned off, took approximately 17 minutes for all of the water to infiltrate.



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- The constant head infiltration rate was determined based on the steady state flow rate of 26 gpm and a head of 0.57 feet. The short-term infiltration rate was calculated to be 1.04 gpm/ft² or 100 in/hr.
- The design infiltration rate for the conditions in test WIT-PIT-1 is 5 in/hr.

WIT-PIT-2

- The bottom of WIT-PIT-2 was located at an approximate depth of 10.5 feet in native soil consisting of sandy Gravel.
- The ground surface at the test pit location is approximately 287 feet based on a survey data provided the contractor.
- Soils observed in the test pit included 6 inches of sod and topsoil over Fill consisting of silty, sandy Gravel with scattered to abundant organic material and cobbles to a depth of 8 feet. Native soils were encountered at a depth of 8 feet and consist of slightly silty, slightly sandy to sandy, coarse Gravel.
- WIT-PIT-2 infiltration test was conducted on January 4, 2010 for over 9 hours starting at about 8:15 AM and was completed at 5:30 PM. The total cumulative volume of water added during the test was approximately 50,800 gallons.
- Water was added to the test pit until steady state flow was achieved. The maximum steady state flow rate of 93 gpm was limited by the amount of water that could be delivered from the fire hydrant. The constant head maintained above the test pit bottom was 0.19 feet. After the flow was turned off, it took approximately 2 minutes for all of the water to infiltrate. Three recovery tests were performed and provided consistent recovery times.
- The constant head infiltration rate was determined based on the steady flow rate of 93 gpm and a head of 0.19 feet. The short-term infiltration rate was calculated to be 3.72 gpm/ft² or 358 in/hr.
- The design infiltration rate for the conditions in test WIT-PIT-2 is 19 in/hr.

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SUMMARY AND CONCLUSIONS

- Two PIT-style infiltration tests were completed in the study area. Soil encountered in the test pits included sod over an upper Fill unit (0.3 to 8 feet) of silty to very silty Gravel with organic material and a lower native unit consisting of glacial outwash sand and gravel.
- A PIT-style infiltration test (WIT-PIT-2) was conducted in the native glacial outwash unit. The short-term infiltration rate for the sandy gravel unit was 358 in/hr based on the maximum flow rate of 93 gpm. This should be considered a minimum short-term infiltration rate for the glacial outwash unit. The observed short-term infiltration rate is very high, indicating that very favorable conditions for infiltration are present in the native glacial outwash unit. We recommend that the bottom of the infiltration basins should be located in the glacial outwash unit.
- An 18-inch sod and organic soil layer was hand placed over the native glacial outwash unit in one of the PIT-style infiltration tests (WIT-PIT-1). Applying a layer of organic soil overlain by sod reduced the short-term infiltration rate to 100 in/hr.
- For design purposes, we recommend applying a correction factor of 18 [based on Table 3.7, Ecology (2005)] to adjust the short-term infiltration rates to develop long-term or design infiltration rates.
- The recommended design infiltration rate is 19 in/hr for the native glacial outwash unit.
- When a sod/organic soil layer is applied to the surface of the native glacial outwash unit, we recommend applying a design infiltration rate no greater than 5 in/hr. The results of the PIT shows that the presence of a sod/organic soil layer will significantly diminish the infiltration rate. The actual infiltration rate will depend on a variety of factors including the thickness of the sod/organic soil layer, amount of fines present, and the degree of compaction during placement of the sod/organic soil layer. Where infiltrating through sod, we recommend an overflow berm or pond with a direct (i.e., sand or gravel) connection to the native glacial outwash unit.
- Infiltration tests were not conducted within the Fill unit. It is likely that the infiltration rate of the Fill unit will be significantly lower because of the presence of organic material and fines.

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Borden, R. and K. Troost, 2001. Late Pleistocene Stratigraphy in the South-Central Puget Lowland, Pierce County, Washington. Washington Division of Geology and Earth Resources. Report of Investigations 33, December 2001.

Hart Crowser, Inc., 2010. Geotechnical Engineering Design Study. Fort Lewis Warriors in Transition Barracks. Fort Lewis, Washington.

Washington State Department of Ecology, 2005. Stormwater Management Manual for Western Washington.

Attachments:

Table 1 - Infiltration Test Results

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Table 1 - Infiltration Test Results

Name	Length in Feet	Width in Feet	Area in Square Feet	Steady- State Head in Feet	Steady- Steady- State Head State Flow in Feet in gpm	Infiltration Rate in gpm/sq ft	Infiltration Rate in in/hr	Correction Factor	Design Infiltration Rate in in/hr
WT PIT-1	9	2	25	0.57	26	1.04	100	18	5
WT PIT-2	2	2	25	0.19	93	3.72	358	18	19

Notes: WT PIT-1 included 18 inches of sand overlain by grass sod placed at the bottom of the infiltration pit, in an attempt to simulate field conditions.

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APPENDIX A FIELD EXPLORATIONS METHODS AND ANALYSIS

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APPENDIX A FIELD EXPLORATIONS METHODS AND ANALYSIS

This appendix documents the processes Hart Crowser used to determine the nature of the site soils. The discussion includes information on the following subjects:

- Explorations and Their Location; and
- Excavation of Test Pits.

Explorations and Their Location

Subsurface explorations for this project consist of two Pilot Infiltration Tests (PITs) and one test boring. The exploration logs within this appendix show our interpretation of the excavation, sampling, and testing data. They indicate the depth where the soils change. Note that the change may be gradual. In the field, we classified the samples taken from the explorations according to the methods presented on Figure A-1 - Key to Exploration Logs. This figure also provides a legend explaining the symbols and abbreviations used in the logs.

Location of Explorations. Figure 2 shows the locations of the explorations. The horizontal locations and vertical elevations were determined from drawings provided by TranSystems and survey information provided by Mortenson Construction. The method used determines the accuracy of the location and elevation of the explorations.

Excavation of Test Pits

Two Pilot Infiltration Tests, designated WIT-PIT-1 and -2 were excavated with a rubber-tired backhoe. WIT-PIT-1 was excavated on January 4, 2010 and WIT-PIT-2 was excavated on December 30-31, 2009. The sides of these excavated pits offer direct observation of the subgrade soils. The test pits were located by and excavated under the direction of a field representative from Hart Crowser. The field representative observed the soil exposed in the test pits and reported the findings on a field log. They also took representative samples of soil types for testing at our laboratory. Groundwater levels or seepage were not observed during excavation. The density and consistency of the soils (as presented parenthetically on the test pit logs to indicate their having been estimated) is based on visual observation only, as disturbed soils cannot be measured for inplace density.

The test pit logs are presented on Figure A-3.

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The Use of Auger Borings

One hollow-stem auger boring, designated WIT-B-1, was drilled on December 29, 2009. The boring used a 3-1/4-inch inside diameter hollow-stem auger and was advanced with a truck-mounted drill rig subcontracted by Hart Crowser. A representative from Hart Crowser continuously observed the drilling. We prepared a detailed field log of the boring. Using the Standard Penetration Test (SPT), we obtained samples at 2-1/2- to 5-foot-depth intervals.

The boring log is presented on Figure A-2 at the end of this appendix.

Standard Penetration Test (SPT) Procedures

This test is an approximate measure of soil density and consistency. To be useful, the results must be used with engineering judgment in conjunction with other tests. The SPT (as described in ASTM D 1586) was used to obtain disturbed samples. This test employs a standard 2-inch outside diameter split-spoon sampler. Using a 140-pound hammer, free-falling 30 inches, the sampler is driven into the soil for 18 inches. The number of blows required to drive the sampler the last 12 inches only is the Standard Penetration Resistance. This resistance, or blow count, measures the relative density of granular soils and the consistency of cohesive soils. The blow counts are plotted on the boring logs at their respective sample depths.

Soil samples are recovered from the split-barrel sampler, field classified, and placed into watertight jars. They are then taken to Hart Crowser's laboratory for further testing as described in Appendix B.

In the Event of Hard Driving

Occasionally very dense materials preclude driving the total 18-inch sample. When this happens, the penetration resistance is entered on logs as follows:

Penetration less than 6 inches. The log indicates the total number of blows over the number of inches of penetration.

Penetration greater than 6 inches. The blow count noted on the log is the sum of the total number of blows completed <u>after</u> the first 6 inches of penetration. This sum is expressed over the number of inches driven that exceed the first 6 inches. The number of blows needed to drive the first 6 inches are not reported. For example, a blow count series of 12 blows for 6 inches, 30 blows for 6 inches, and 50 (the maximum number of blows counted within a 6-inch increment for SPT) for 3 inches would be recorded as 80/9.

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Dames & Moore Sampler

Based on the gravelly nature of the soil at the site, an oversized Dames & Moore (3-inch-diameter) split-spoon sampler was used in an attempt to retrieve soil samples. The Dames & Moore sampler was driven in a similar manner as a standard split-spoon sample as described above and density/consistency of the soil was interpreted based on the use of the larger sampler.

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Key to Exploration Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:

Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and probes is estimated based on visual observation and is presented parenthetically on the

SAND or GRAVEL Density	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 to 4	Very soft	0 to 2	< 0.125
Loose	4 to 10	Soft	2 to 4	0.125 to 0.25
Medium dense	10 to 30	Medium stiff	4 to 8	0.25 to 0.5
Dense	30 to 50	Stiff	8 to 15	0.5 to 1.0
Very dense	>50	Very stiff	15 to 30	1.0 to 2.0
		Hard	>30	>2.0

Sampling Test Symbols

1.5" I.D. Split Spoon

Grab (Jar)

Core Run

3.0" I.D. Split Spoon

Shelby Tube (Pushed)

✓ Bag

U Cuttings

SOIL CLASSIFICATION CHART

	A LOD DIVIDI	ONO	SYMI	BOLS	TYPICAL
IVI	AJOR DIVISI	UNS	GRAPH	LETTER	DESCRIPTIONS
	GRAVEL AND	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	GRAVELLY SOILS	(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
COARSE GRAINED SOILS	MORE THAN 50% OF COARSE FRACTION	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	RETAINED ON NO 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS	SAND AND	CLEAN SANDS		sw	WELL-GRADED SANDS GRAVELLY SANDS LITTLE OR NO FINES
LARGER THAN NO 200 SIEVE SIZE	SANDY SOILS	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
	FRACTION PASSING ON NO 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		sc	CLAYEY SANDS, SAND - CLAY MIXTURES
				ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS SANDY CLAYS, SILTY CLAYS LEAN CLAYS
00.20				OL	ORGANIC SILTS AND ORGANIC SILT CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO 200 SIEVE				МН	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		СН	INORGANIC CLAYS OF HIGH PLASTICITY
				ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
н	IGHLY ORGANIC	SOILS	علد علد	PT	PEAT, HUMUS SWAMP SOILS WITH HIGH ORGANIC CONTENTS

Moisture

Dry Little perceptible moisture

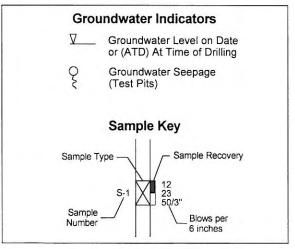
Damp Some perceptible moisture, likely below optimum

Moist Likely near optimum moisture content

Wet Much perceptible moisture, likely above optimum

Minor Constituents	Estimated Percentage	
Trace	<5	
Slightly (clayey, silty, etc.)	5 - 12	
Clayey, silty, sandy, gravelly	12 - 30	
Very (clayey, silty, etc.)	30 - 50	

Labo	ratory Test Symbols
GS	Grain Size Classification
CN	Consolidation
UU	Unconsolidated Undrained Triaxial
CU	Consolidated Undrained Triaxial
CD	Consolidated Drained Triaxial
QU	Unconfined Compression
DS	Direct Shear
K	Permeability
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits
	Water Content in Percent
	Liquid Limit Natural Plastic Limit
PID	Photoionization Detector Reading
CA	Chemical Analysis
DT	In Situ Density in PCF
ОТ	Tests by Others





17597-00 Figure A-1

Tuesday, October 26, 2010

12/09

Boring Log WIT-B-1

Location: N 653228 E 1128962

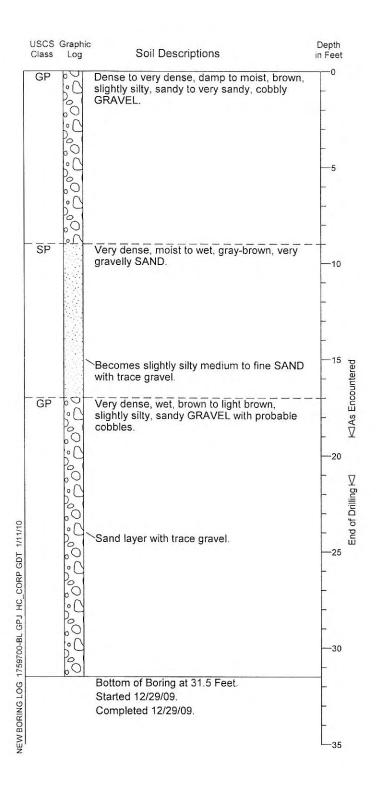
Approximate Ground Surface Elevation: 278.5 Feet

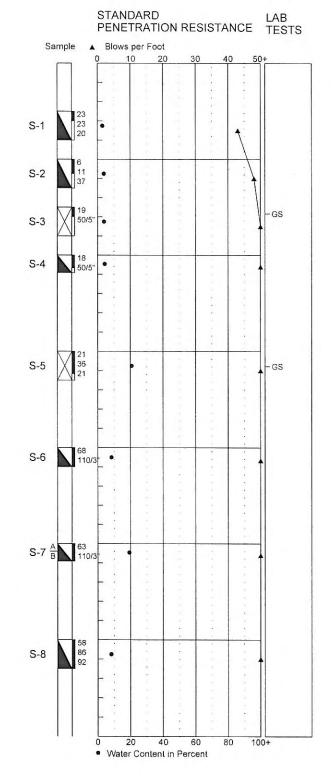
Horizontal Datum: WA State Plane South

Vertical Datum: NAVD 88

Drill Equipment: Hollow Stem Auger Hammer Type: 140 lb. Auto-trip Hole Diameter: 8 inches

Logged By: M. Veenstra Reviewed By: P. Cordell





1. Refer to Figure A-1 for explanation of descriptions and symbols.

2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual

3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).

4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary

with time.



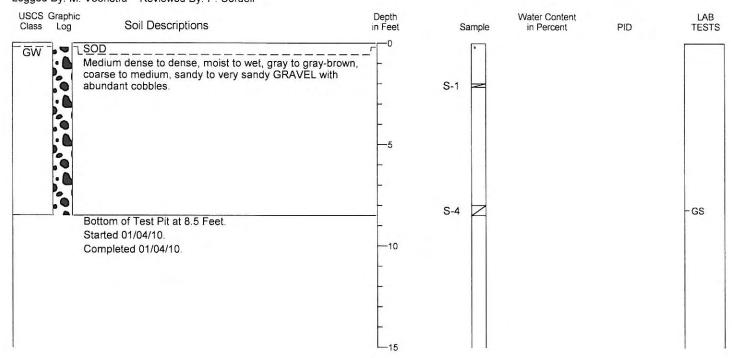
17597-00

12/09

Figuræskday, October 26, 2010

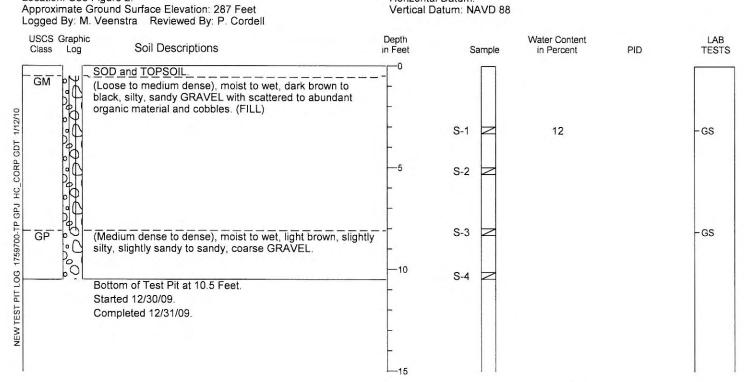
Section: Appendix JJ Log WIT-PIT-1

Location: See Figure 2. Approximate Ground Surface Elevation: 276 Feet Logged By: M. Veenstra Reviewed By: P. Cordell Horizontal Datum: Vertical Datum: NAVD 88



Test Pit Log WIT-PIT-2

Location: See Figure 2.



Horizontal Datum:

1. Refer to Figure A-1 for explanation of descriptions and symbols.

2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.

3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).

4. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure A-3

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APPENDIX B LABORATORY TESTING PROGRAM

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APPENDIX B LABORATORY TESTING PROGRAM

A laboratory testing program was performed for this study to evaluate the basic index and geotechnical engineering properties of the site soils. The tests performed and the procedures followed are outlined below.

Soil Classification

Field Observation and Laboratory Analysis. Soil samples from the explorations were visually classified in the field and then taken to our laboratory where the classifications were verified in a relatively controlled laboratory environment. Field and laboratory observations include density/consistency, moisture condition, and grain size and plasticity estimates.

The classifications of selected samples were checked by laboratory tests such as grain size analysis. Classifications were made in general accordance with the Unified Soil Classification (USC) System, ASTM D 2487, as presented on Figure B-1.

Water Content Determinations

Water contents were determined for most samples recovered in the explorations in general accordance with ASTM D 2216, as soon as possible following their arrival in our laboratory. Water contents were not determined for very small samples nor samples where large gravel contents would result in values considered unrepresentative. The results of these tests are plotted at the respective sample depth on the exploration logs. In addition, water contents are routinely determined for samples subjected to other testing. These are also presented on the exploration logs.

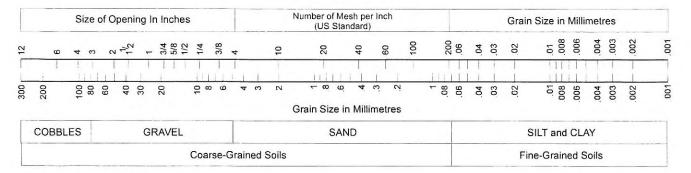
Grain Size Analysis (GS)

Grain size distribution was analyzed on representative samples in general accordance with ASTM D 422. Wet sieve analysis was used to determine the size distribution greater than the U.S. No. 200 mesh sieve. The results of the tests are presented as curves on Figures B-2 and B-3 plotting percent finer by weight versus grain size.

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Unified Soil Classification (USC) System Soil Grain Size



Coarse-Grained Soils

G W	GP	GM	G C	s w	SP	SM	s c		
Clean GRAV	/EL <5% fines	GRAVEL wil	th >12% fines	Clean SAN	D <5% fines	* SAND with	>12% fines		
GRA	GRAVEL >50% coarse fraction larger than No. 4				SAND >50% coarse fraction smaller than No. 4				
		Coarse-	Grained Soils >50	% larger than No.	200 sieve				

G W and S W
$$\left(\frac{D_{60}}{D_{10}}\right) > 4 \text{ for G W}$$
 & $1 \le \left(\frac{(D_{30})^2}{D_{10} \times D_{60}}\right) \le 3$

G P and S P Clean GRAVEL or SAND not meeting requirements for G W and S W

G M and S M Atterberg limits below A line with PI <4

G C and S C Atterberg limits above A Line with PI >7

D₁₀, D₂₀, and D₆₀ are the particles diameter of which 10, 30, and 60 percent, respectively, of the soil weight are finer.

Fine-Grained Soils

ML	CL	OL	MH	СН	ОН	Pt
SILT	CLAY	Organic	SILT	CLAY	Organic	Highly
S	oils with Liquid Limit <	50% So		ils with Liquid Limit >	Organic Soils	
		Fine-Grained So	oils >50% smaller th	an No. 200 sieve		
60	1 1	1 1		1		6
50 –				СН		- 5
40 –	CL			ALine		- 4
30 –	O L			ALITE		- 3
20 –				M	H or O H	- 2
10 -	CL-ML					- 1
0	I I 10 20	or C	0 50	60	1	90

Liquid Limit



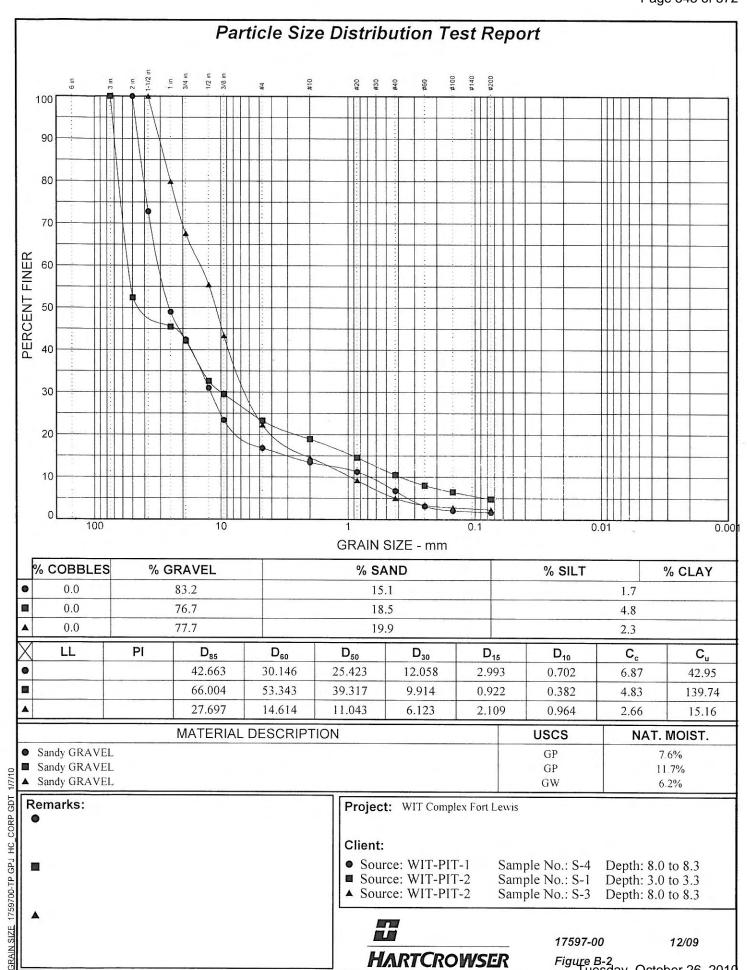
^{*} Coarse-grained soils with percentage of fines between 5 and 12 are considered borderline cases requiring use of dual symbols.

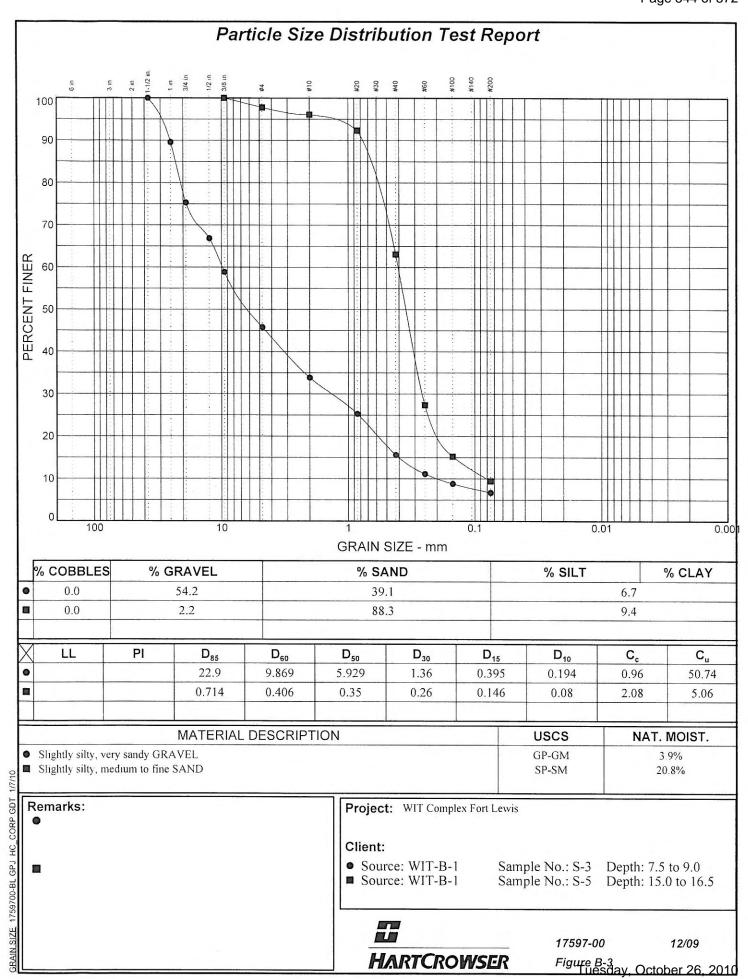
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Figure B-2 Tuesday, October 26, 2010





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	APPENDIX C EXISTING EXPLORATIONS AND LABORATORY RESULTS BY OTHERS

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APPENDIX C EXISTING EXPLORATIONS AND LABORATORY RESULTS BY OTHERS

Eight test borings and their associated laboratory test results were completed by CivilTech in 2009. These were used to gain an understanding of the subsurface conditions at the site. The site plan for these test borings, the exploration logs, and the laboratory test results are presented in this appendix.

Logs produced by others are presented for reference only and Hart Crowser is not responsible for the accuracy or completeness of the information presented in the logs. Approximate locations of these explorations are shown on Figure 2; actual locations may differ from those shown.

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Hart Crowser Page C-1

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B-1-09 Fort Lewis Warrior in Transition

Contract # DACA67-08-D-1014

Drill Rig: HS Auger

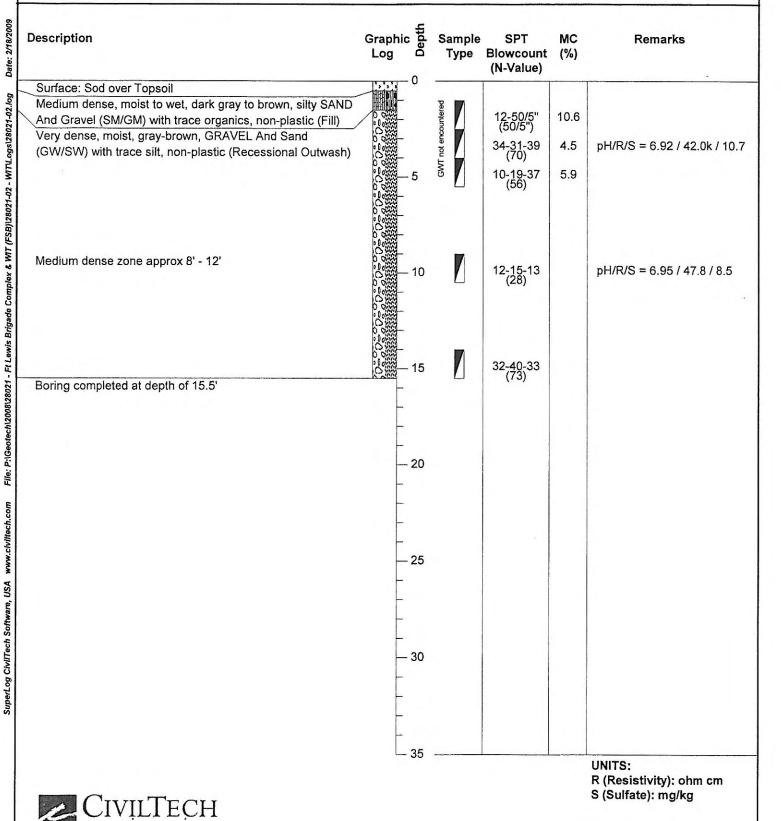
Sampling: SPT

Date Completed: 1-7-09

Date Started: 1-7-09

Logged By: MW
Total Depth: 15.5 feet

Elevation: 280' (Approx.)
Groundwater: Not Encountered



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B-2-09 Fort Lewis Warrior in Transition

Contract # DACA67-08-D-1014

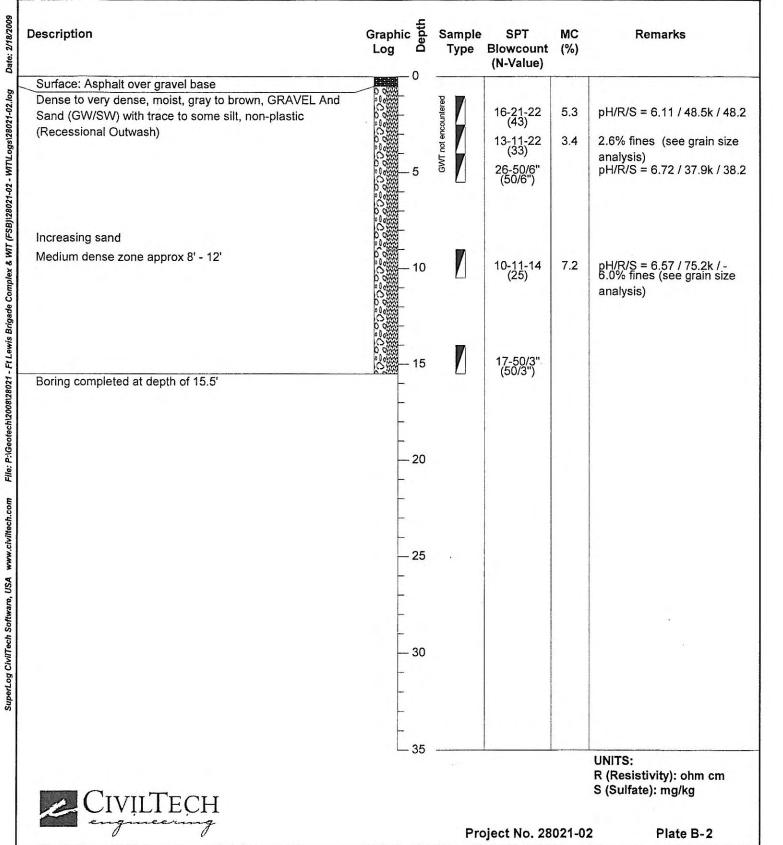
Drill Rig: HS Auger

Sampling: SPT Logged By: MW Date Completed: 1-8-09 Elevation: 280' (Approx.)

Date Started: 1-8-09

Total Depth: 15.5 feet

Groundwater: Not Encountered



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B-3-09 Fort Lewis Warrior in Transition

Contract # DACA67-08-D-1014

Drill Rig: HS Auger

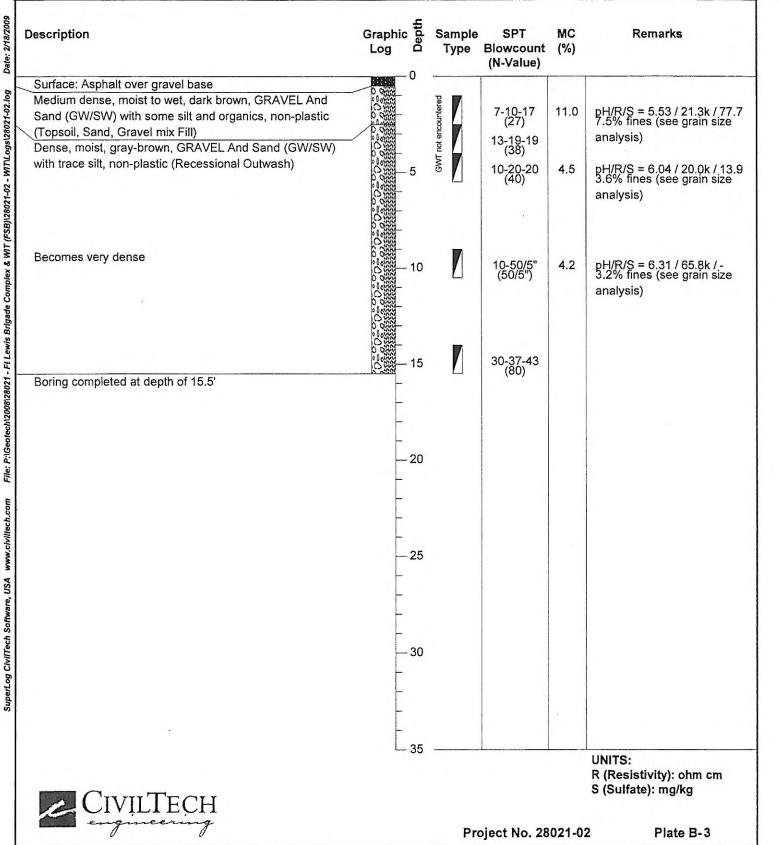
Sampling: SPT

Date Completed: 1-9-09 Elevation: 280' (Approx.)

Date Started: 1-9-09

Logged By: MW Total Depth: 15.5 feet

Groundwater: Not Encountered



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B-4-09 **Fort Lewis Warrior in Transition**

Contract # DACA67-08-D-1014

Drill Rig: HS Auger

Sampling: SPT Logged By: MW Date Completed: 1-7-09 Elevation: 280' (Approx.)

Date Started: 1-7-09

Total Depth: 15.5 feet

Groundwater: Not Encountered

Driller/Foreman: Cascade/A. Flagan

Description	Graphic the Log	Sample Type	SPT Blowcount (N-Value)	MC (%)	Remarks
Surface: Sod over Topsoil	0				
Medium dense, moist, gray-brown, GRAVEL And Sand (GW/SW) with trace to some silt, non-plastic (Recessional Outwash) Becomes very dense at 3'		GWT not encountered	7-11-16 (27) 14-23-33 (56) 17-35-50 (85)	7.0	No Recovery, on rock pH/R/S = 7.09 / 62.5k / 4.93 6.3% fines (see grain size analysis)
	- - - - - - - - - - - - - - - - - - -		30-39-45 (84)		pH/R/S = 7.20 / 68.5k / 7.26
Boring completed at depth of 15.5'	CO 15	7	38-50/4" (50/4")		
₹ •	_ 20 				
	- - 25 -				
	_ _ _ 30				
CivilTech	<u></u> 35		J		UNITS: R (Resistivity): ohm cm S (Sulfate): mg/kg

Project No. 28021-02

Plate B-4

Page 169 of 312 Date Started: 1-7-09

B-5-09 **Fort Lewis Warrior in Transition**

Contract # DACA67-08-D-1014

File: P:\Geotech\2008\28021 - Ft Lewis Brigade Complex & WIT (FSB)\28021-02 - WITLogs\28021-02.log

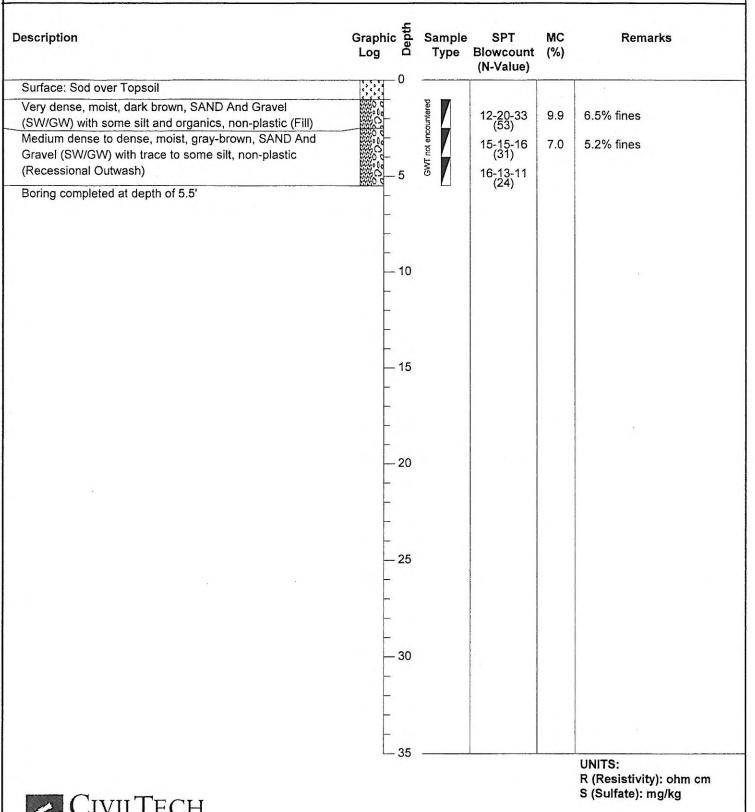
SuperLog CivilTech Software, USA www.civiltech.com

Drill Rig: HS Auger

Total Depth: 5.5 feet

Sampling: SPT Logged By: MW Date Completed: 1-7-09 Elevation: 280' (Approx.)

Groundwater: Not Encountered



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B-6-09 **Fort Lewis Warrior in Transition**

Contract # DACA67-08-D-1014

Date: 2/18/2009

Drill Rig: HS Auger

Total Depth: 15.5 feet

Sampling: SPT Logged By: MW Date Started: 1-7-09 Date Completed: 1-7-09 Elevation: 280' (Approx.)

Groundwater: Not Encountered

Driller/Foreman: Cascade/A. Flagan

Description	Graphic Log	Sample Type	SPT Blowcount (N-Value)	MC (%)	Remarks
Surface: Sod over Topsoil	333 0				
Dense, moist to wet, dark gray-brown, GRAVEL And Sand (GW/SW) with some silt and trace organics, non-plastic (Fill)	0.00.00	GWT not encountered	14-26-35 (61) . 25-26-23 (49)	8.4	pH/R/S = 6.31 / 67.1k / 12.1 Blowcount overstated on rock 5.1% fines
	0000 — 5	GWI	16-16-16 32	15.5	pH/R/S = 6.53 / 32.9k / 6.86
Dense, moist, gray-brown, GRAVEL And Sand (GW-SW) with trace silt, non-plastic (Recessional Outwash)	0 ° 0 ° 0 ° 0 ° 0 ° 0 ° 0 ° 0 ° 0 ° 0 °				
	00 — 10 00 — 100 —		20-26-21 (47)	6.1	pH/R/S = 7.59 / 22.3k / -
	000 1000 1000 1000 1000 1000 1000 1000		15-19-15 (34)		
Boring completed at depth of 15.5'					
	_ 20				
	25 				
	Ė				
	— 30 -				
	35				
					UNITS: R (Resistivity): ohm cm



Project No. 28021-02

Plate B-6

S (Sulfate): mg/kg

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B-7-09 **Fort Lewis** Warrior in Transition

Contract # DACA67-08-D-1014

Date: 2/18/2009

File: P:\Geotech\2008\28021 - F\(Lewis Brigade Complex & WIT (FSB)\28021-02 - WITLogs\28021-02.log

Drill Rig: HS Auger

Sampling: SPT

Date Completed: 1-7-09 Elevation: 280' (Approx.)

Date Started: 1-7-09

Logged By: MW

Total Depth: 15.5 feet

Groundwater: Not Encountered

Driller/Foreman: Cascade/A. Flagan

Description	Graphic Log	Sample Type	SPT Blowcount (N-Value)	MC (%)	Remarks
Surface: Sod over Topsoil	7557 0				
Loose to medium dense, moist to wet, dark brown, organic, silty, GRAVEL and Sand (GM-SM), non-plastic (Topsoil, Sand, Gravel mix Fill)		GWT not encountered	8-7-6 (13) 3-4-6	28.5	pH/R/S = 6.33 / 40.6k / 14.6
Decreasing silt and organics (some) (GW-SW)		T not	3-4-6 (10)		printed = 0.557 40.5K7 14.0
Decreasing silt and organics (some) (GVV-SVV)	5 — 5	8	4-5-16 (21)	17.7	8.9% fines (see grain size analysis)
Medium dense, moist, gray-brown, GRAVEL And Sand (GW-SW) with trace silt, non-plastic (Recessional Outwash)	0.00				
			8-10-10 (20)	8.6	
Becomes very dense	C = C = C = C = C = C = C = C = C = C =		10 27 44		
Boring completed at depth of 15.5'	15		10-37-44 (81)		
	— 20 –				
	25 				
	30 				
	_ 35				

Project No. 28021-02

Plate B-7

R (Resistivity): ohm cm S (Sulfate): mg/kg

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B-8-09 **Fort Lewis** Warrior in Transition

Contract # DACA67-08-D-1014

Drill Rig: HS Auger

Sampling: SPT Logged By: MW

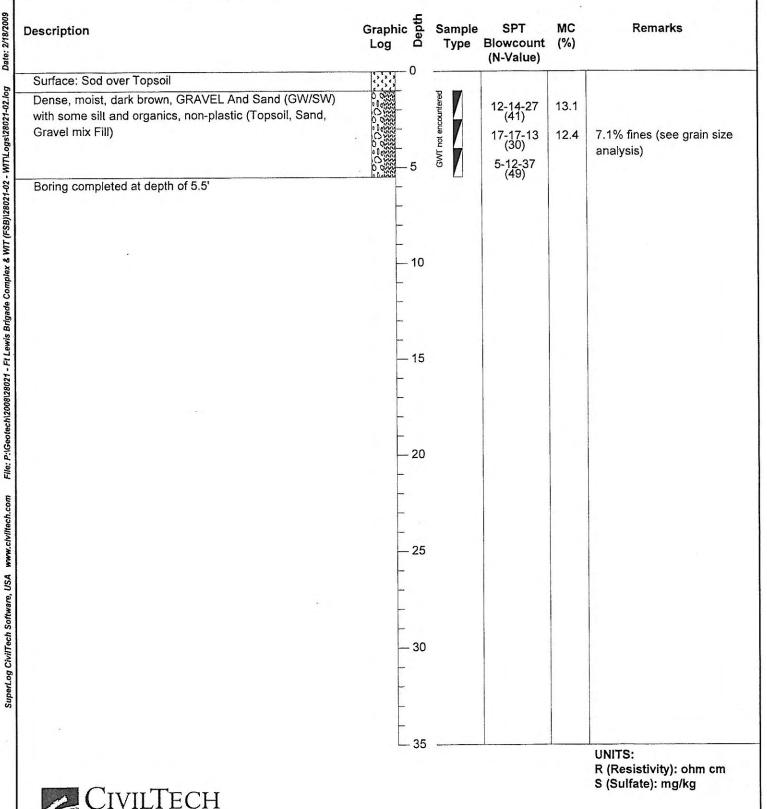
Date Completed: 1-7-09

Elevation: 280' (Approx.)

Date Started: 1-7-09

Total Depth: 5.5 feet

Groundwater: Not Encountered



KEY:

Indicates 3-inch OD Dames & Moore Sample.

Indicates 2-inch OD Split Spoon Sample (SPT).

Indicates Disturbed Sample.

Indicates No Recovery.

Indicates Bag Sample.

Indicates Shelby Tube Sample.

COMPONENT DEFINITIONS

COMPONENT SIZE RANGE Boulders Larger than 12 in Cobbles 3 in to 12 in Gravel 3 in to No 4 (4.5mm) Coarse gravel 3 in to 3/4 in Fine gravel 3/4 in to No 4 (4.5mm) Sand No. 4 (4.5mm) to No. 200 (0.074mm) Coarse sand No. 4 (4.5 mm) to No. 10 (2.0 mm) Medium sand No. 10 (2.0 mm) to No. 40 (0.42 mm) Fine sand No. 40 (0.42 mm) to No. 200 (0.074 mm) Silt and Clay Smaller than No. 200 (0.074 mm)

ATD: At Time of Drilling

BGS: Below Ground Surface

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace or little Some Clayey, silty, sandy, gravelly And	1 - 5% 5 - 12% 12 - 30% 30 - 50%

MOISTURE CONTENT

DRY	Absence of moisture, dusty,
	dry to the touch.
DAMP	Some perceptible
	moisture; below optimum
MOIST	No visible water; near optimum
	moisture content
WET	Visible free water, usually
VVE I	
	soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHE	SIONLESS SOIL	.s	COHESIVE SOILS				
Density	N (blows/ft)	Approximate Relative Density (%)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)		
Very Loose Loose Medium Dense Dense Very Dense	0 to 4 4 to 10 10 to 30 30 to 50 over 50	0 - 15 16 - 35 36 - 65 66 - 85 86 - 100	Very Soft Soft Medium Stiff Stiff Very Stiff Hard	0 to 2 2 to 4 4 to 8 8 to 15 15 to 30 over 30	< 250 250 - 500 501 - 1000 1001 - 2000 2001 - 4000 > 4000		



	MAJOR DIVISIO	SYMBOL SYMBO		LETTER SYMBOL	TYPICAL DESCRIPTIONS
	GRAVEL AND	CLEAN GRAVELS (LITTLE OR NO FINES)	0.000 0.000 0.000	GW	WELL-GRADED GRAVELS, GRAVEL- SAND MIXTURES, LITTLE OR NO FINE
COARSE	GRAVELLY SOILS			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
GRAINED SOILS	MORE THAN 50% OF	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL-SAND- SILT MIXTURES
	COARSE FRACTION RETAINED ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)	Kerte.	GC	CLAYEY GRAVELS, GRAVEL-SAND- CLAY MIXTURES
	SAND	CLEAN SAND		sw	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL	AND SANDY SOILS	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
IS <u>LARGER</u> THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				sc	CLAYEY SANDS, SAND-CLAY MIXTURES
				ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS <u>SMALLER</u> THAN NO. 200 SIEVE SIZE	SILTS LIQUID LIMIT	GREATER THAN		МН	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				СН	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
Н	IGHLY ORGANIC	SOILS		PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM



APPENDIX C - LABORATORY TESTS

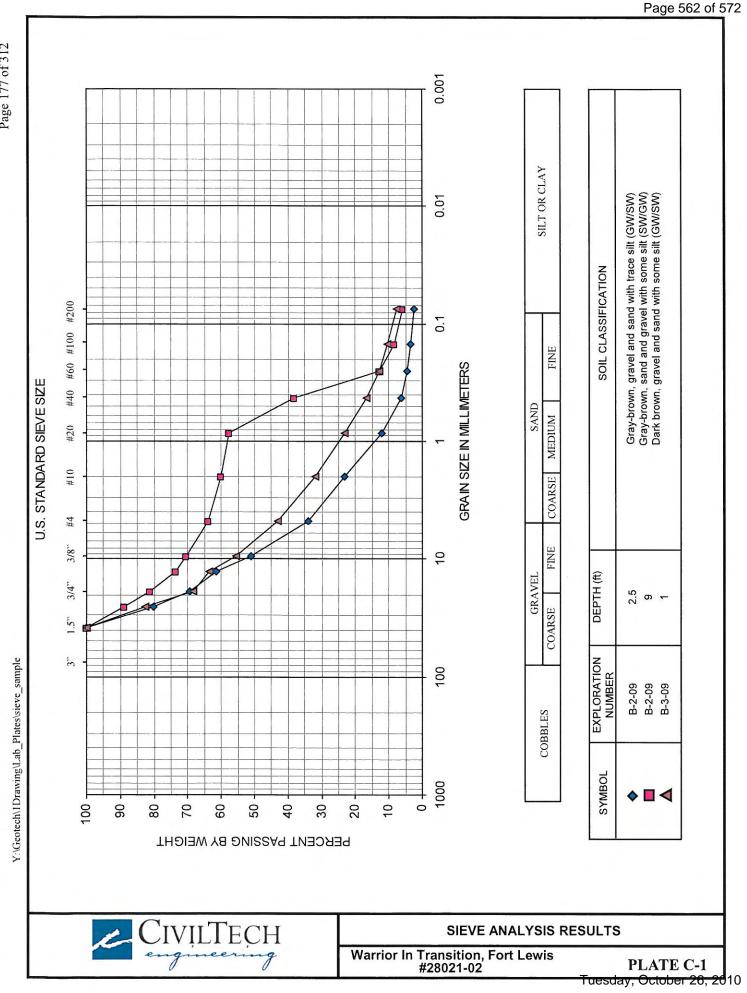
Our laboratory testing program included evaluations of moisture content, #200 wash, and sieve analysis.

Moisture content (ASTM D 2216) determinations were performed on selected soil samples as an aid in the classification and evaluation of soil properties. The results of these tests are presented on the Logs of Borings at the appropriate sample depths.

Three #200 wash tests (ASTM D 1154) were performed on selected soil samples to quantify the percentage passing the #200 sieve to aid in soil classification. The results of the tests are presented on the boring logs at the appropriate sample depths.

Eight sieve analysis tests (ASTM C 136) were performed on selected soil samples to evaluate the gradation characteristics of the soils and to aid in soil classification. Results of the tests are presented on Plates C-1 through C-3.

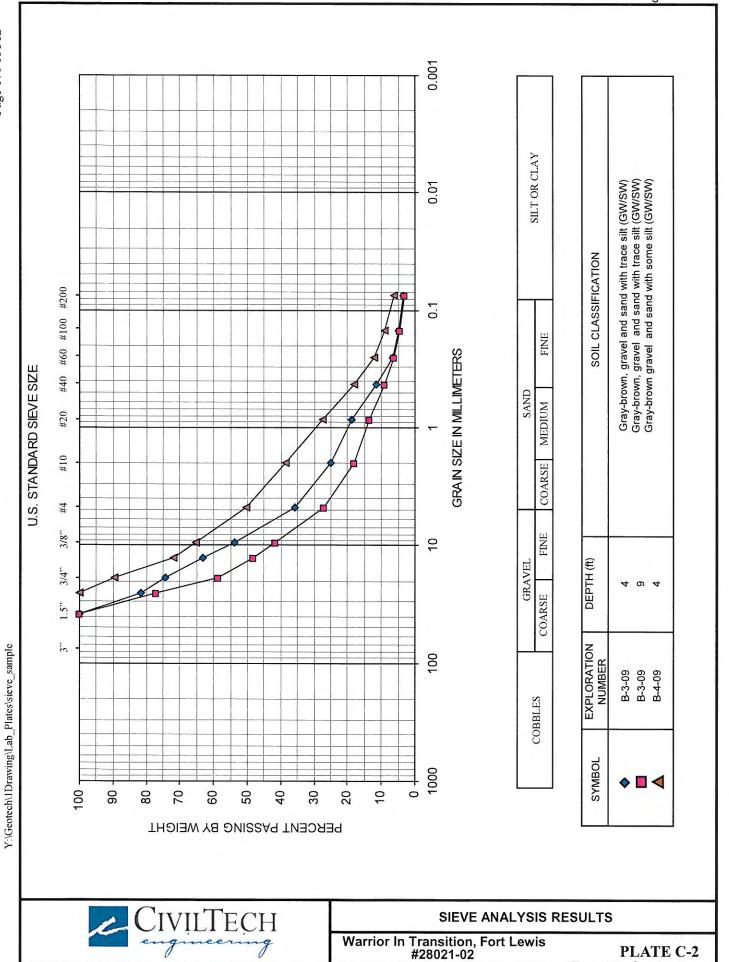
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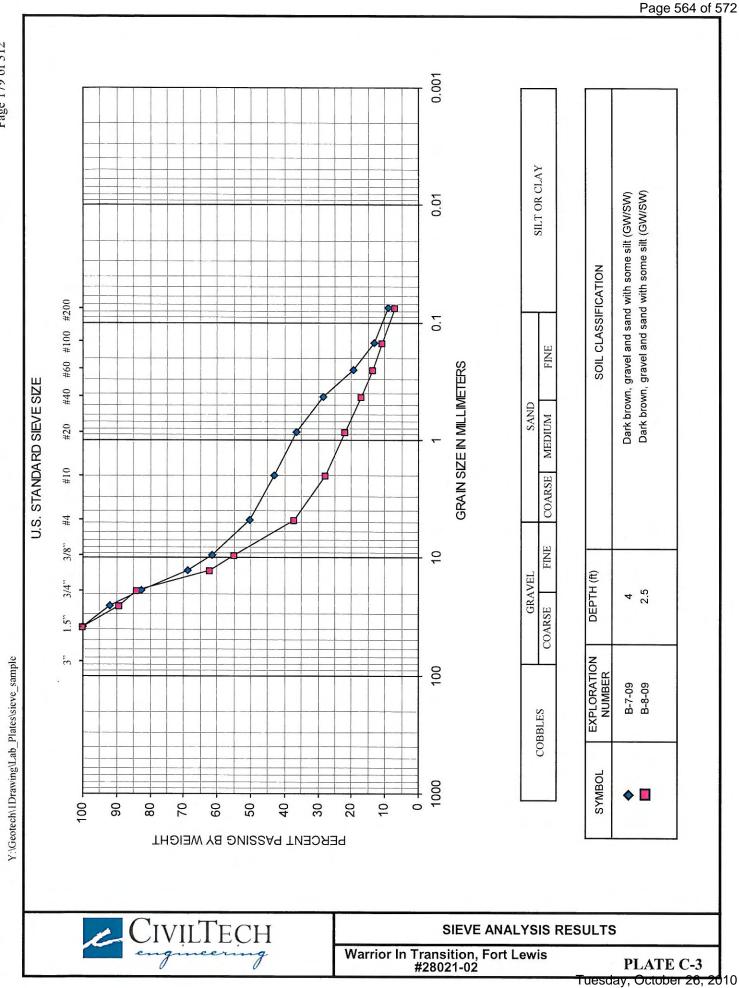
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Section: Appendix A. Geotechnical Information



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